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TRANSACTIONS

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OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1885.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1885.

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The following papers and discussions have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the Boston Transcript. As here presented, the papers are printed in full, and the discussions are not only much fuller than in the weekly reports, but, where it appeared necessary, have been carefully revised by the speakers.

The Committee on Publication and Discussion take this opportunity to repeat what they have before stated, that the Society is *not to* be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature in the papers and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

O. B. Hadwen,
William H. Hunt,
Francis H. Appleton,
Committee on Publication and Discussion.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 3, 1885.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

The President delivered his annual address, as follows: —

ADDRESS OF PRESIDENT MOORE.

Ladies and Gentlemen of the Massachusetts Horticultural Society: —

Again we have assembled here to commence anew our work, and also to look back upon the past and to profit by its teachings. The last has been an eventful year in the history of this Society, and the first in which the death of a President has occurred.

Hon. Francis B. Hayes, then in the full vigor of mature manhood, was, on the 20th of September, suddenly called from his earthly duties to a higher life. Mr. Hayes, as President, served this Society well; he was attentive, energetic, and vigilant in the performance of his duties; a good financier, an excellent presiding officer, urbane in manner, and courteous to all. He was an enthusiastic lover of trees, plants, and flowers, and of everything pertaining to rural life; and constantly interested in acquiring information upon horticulture from books, as evinced by his use of our library, as well as of his own.

His country home, at Lexington, under his lavish expenditures and extensive improvements both in buildings and grounds, was fast becoming one of the notable estates in the suburbs of Boston.

The large and frequent contributions from his gardens of flowers, fruits, and vegetables have added much interest to our exhibitions. By his death this Society has met with a great loss. His funeral was attended by many of our members, who followed the body to its resting-place in Mount Auburn, that beautiful garden of the dead established by this Society many years ago.

This Society has always been proud of the record of its founders; them, and those other members of our Society, true friends of horticulture, who have passed away, we remember with gratitude. They commenced a noble work, which we, who have had the benefits of their experience and example, are to continue. It is in the nature of a trust, which we are bound in honor to improve for the benefit of those who come after us.

At the same time let us not forget the debt of gratitude which we owe to the living — to our venerable Ex-President Wilder, who has devoted a long life to the advancement of the science and the practical development of horticulture, and who still, in his green old age, is as anxious for new horticultural products and methods of cultivation as a young beginner. To the other Ex-Presidents, and to many members who have aided the Society in its progress, — to the tried friends of this institution, who have so often assisted in making our exhibitions attractive, by sending to our halls rare and beautiful plants from their conservatories, and who by other substantial aid afforded to our Society have done so much for the encouragement of horticulture, — to all of these we owe a debt of gratitude.

The awarding committees report that the weekly shows have been larger, better, and more fully attended than usual.

The four large shows, at which the public have been charged a small admission fee, have, under the prudent management of the Committee of Arrangements, who have had them in full charge, proved more successful than usual, not only in the quantity and quality of the exhibits, but also in the receipts for admission, which were much larger than in previous years.

The public appreciation of the beauty of our exhibitions is yearly growing; and, as the taste for beautiful flowers and fine fruit increases, so will the desire to attend our exhibitions become greater every year, until instead of hundreds there may be, in the near future, thousands to crowd our halls.

The amount of money appropriated for prizes, for the year 1884, was $3,450; this has been increased to $5,100 for the year 1885.

A policy of liberal premiums, so far as may be warranted by a prudent regard for the condition of the Society's finances, is the true course to adopt to secure the most successful exhibitions.

With this liberal inducement in the increase of premiums, let our cultivators of flowers, fruits, and vegetables remember that soon this cold winter will have passed and spring will have come; let us all be prepared in time to take full advantage of the seasons, and bring to our halls the rarest and best products of our skill, and, by such united efforts on the part of all, make our displays better than any we have ever had. And let each of our members realize the importance of his individual contribution; for it is their aggregated aid that makes our large displays.

We have, so far as horticulture is concerned, one of the most extensive and best libraries in this country. The privilege of its use is of much more value to any person seeking information in regard to plants, fruits, flowers, and vegetables, than the cost of membership in the Society; and those who love rural life, who admire plants and flowers for their beauty, who desire to grow the luscious fruits which ripen so well under our bright sunshine, who look with wonder and respect upon the noble trees that adorn our streets and pleasure grounds, many of them of much more than a century's duration, can well consult the books on these shelves for information as to what, when, and how to plant to produce the most favorable results.

But, though we have one of the best libraries, I could wish that the accommodations for the books were more commensurate with their value. The Chairman of the Committee on the Library, in his report, again asks for more room for the large accumulation of books for which we have no adequate provision, and suggests, as a remedy for this, that we build a gallery around this room, fitted with cases. By the report of the Secretary and Librarian we are informed that there have been added to the library, since the year 1878, 1,400 books and 750 pamphlets, many of them rare and of great value. Some books of the least value are stored in other rooms in this building, and many of the shelves in the book cases in this room contain double rows of books. This is an important matter, and the request of the Library Committee should be considered and prompt action taken.

The Secretary, who is also Librarian, has attended to his duties in that careful and correct manner for which he is noted. Frequent calls upon his time for information relating to the library, identifi-

cation of fruits and botanical specimens, and a multitude of other points, prevent his getting the Society's TRANSACTIONS in print as soon as would be desirable, and for that reason it would appear to be proper to furnish him some assistance.

The papers and discussions before our Society have increased in interest very much in the last few years, with a good prospect of their being still better the present season. The information brought out at these meetings adds very much to the worth of our TRANSACTIONS, and is much sought for by the public. To make these meetings as useful as possible every member should contribute all the aid in his power.

The Treasurer not having settled with the Mount Auburn Cemetery Corporation will be unable to make his report today. He is also Superintendent of the Building, which he has managed carefully and economically, and he is entitled to credit therefor.

The awarding committees of our Society have performed their duties in a prompt and faithful manner, and have given good satisfaction the past year. The Committee of Arrangements have performed their duties well, and shown good taste and excellent judgment in the management of the four large exhibitions, which thereby have resulted in greater pecuniary advantage than usual to the Society.

In many of the States of the Union horticultural societies are directly encouraged by grants of money, or by the printing, at the expense of the State, of large editions of their transactions for public distribution; the youthful State of Kansas having in each of the years 1882 and 1883 appropriated $4,500 in aid of the State Horticultural Society. Considering the large amount of money awarded by our Society in premiums, it would appear a fair question whether it is not entitled to State bounty for that purpose, to the same amount, and on the same conditions, as it is given to the agricultural societies of the State. I therefore recommend to the Society an early consideration of this matter.

On motion of C. H. B. Breck, the thanks of the Society were presented to President Moore for his address, and it was referred to the Executive Committee to consider the recommendations contained in it.

The President, as Chairman of the Executive Committee, reported the reappointment by that Committee of Robert Manning,

as Secretary and Librarian, and George W. Fowle, as Treasurer of the Society and Superintendent of the Building, for the year 1885.

The appropriations recommended by the Executive Committee, on the 1st of November and the 6th of December, 1884, came up for final action, and were voted by the Society, as follows: —

For Prizes and Gratuities, —	
For Plants and Flowers	$2,500
For Gratuities for the encouragement of the exhibition of flowers during the winter months . .	100
For Fruits	1,500
For Vegetables	800
For Gardens	200
	$5,100
For the Committee on the Library, for the purchase of Books and Periodicals, Binding of Books, and Incidental Expenses of the Committee . . .	$300
For continuing the Card Catalogue of Plates . .	100
For the Committee on Publication and Discussion .	200
For the expenses of the Committee of Arrangements,	300

C. H. B. Breck announced the decease, on the 10th of December, of Francis Lyman Winship, for many years Recording Secretary of the Society, and moved the appointment of a committee to prepare memorial resolutions. The motion was carried, and the Chair appointed Mr. Breck, William J. Underwood, and John C. Hovey, as that committee.

Arthur W. Blake, of Brookline, was proposed by Hon. Marshall P. Wilder, as a Life Member of the Society.

John L. Gardner, of Boston, and
Miss Annie C. Putnam, of Boston,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

Joseph H. Woodford moved that the Society appropriate a sum not exceeding $20, to supply the deficiency in the subscription for

silver vases for prizes for roses, at the Rose Exhibition in June last. The motion was referred to the Executive Committee.

Adjourned to Saturday, January 10.

MEETING FOR DISCUSSION.

The Climate and Horticulture of New England.

By John E. Russell, Leicester.

Mr. President, Gentlemen and Ladies:—

This sharp January day, with hard, deep-frozen ground and threats of lower temperature, is not unseasonable in our climate, nor does it interfere with the work of the members of our Society. It allows time for the winter meetings; and I thank you for honoring me with an invitation to address this the initial gathering of the year. Let me, sir, congratulate the Society upon the good work of the last year. I rejoice to know that our membership is enlarged, our influence spreading, our exhibitions so zealously maintained and so well attended, and our treasury in such a satisfactory condition.

At this opening meeting, a few remarks upon the climate of our region and the history of our horticulture may not be out of place.

To the horticulturist climate is a topic of ever-present interest. Like our English cousins we are always growling about it, and whenever at loss for conversation we "resume the weather." I have often thought, in the midst of one of our terrible winters which so try the courage and irritate the nerves, that our hard New England was too inhospitable to be the habitation of man. At this gloomy period I have yearned, as those who wait for the morning, for the miracles of spring, so vivid upon these Northern shores, and for the beauties of June, the crown and glory of the New England year.

In my wide experience, whether under the rosy light reflected by the tideless Mediterranean, or where the great swell of the Pacific breaks upon shores whose verdure never fails, and tropic islands the glory of whose fronded palms delights the voyager from afar, I have experienced no such sensation of joy as comes with our delicious June. It is a new heaven and a new earth, making good to us the doctrine of compensation, and purging our minds of all unhappy recollections of winter. But it is so short!

It was in the early summer of their first experience that Edward

Winslow, Governor of Plymouth Colony, wrote to England with enthusiasm of the climate and the flora, the vines, sweet with their delicious perfume, the wild "damsons," and the forest roses, and the richness of the sea-food.

No doubt he expected that June would last until December. He had yet to learn of the power of the midsummer sun, and the parching droughts that were to threaten the very existence of the colonists. His clusters of thick-skinned, foxy grapes have surely set the children's teeth on edge; his acrid damsons have disappeared from our sylva; and the treasures of food hidden in the sea-sands chiefly serve to vary our sustenance during the season of clams.

A true descendant of the Pilgrims, the eloquent Rufus Choate, said: "Take the climate of New England in summer, hot today, cold to-morrow, mercury at eighty degrees in the shade in the morning, with a sultry wind south-west. In three hours more a sea-turn, wind at east, a thick fog from the bottom of the ocean, and a fall of forty degrees. Now so dry as to kill all the beans in New Hampshire, then floods carrying off all the dams and bridges on the Penobscot and the Androscoggin; snow in Portsmouth in July, and the next day a man and a yoke of oxen killed by lightning in Rhode Island. You would think the world was coming to an end. But we go along. Seed-time and harvest never fail. We have the early and the latter rains; the sixty days of hot corn weather are pretty sure to be measured out to us; the Indian summer, with its bland south winds and mitigated sunshine, brings all up, and about the 25th of November, being Thursday, a grateful people gather about the Thanksgiving board, with hearts full of gratitude for the blessings that have been vouchsafed to them."

There is a popular belief that rough and inclement climates are the especial nurses of the spirit of independence; hence the heroic lines, always quoted in the after-dinner speeches of our friends from New Hampshire: —

> "Man is the nobler growth our realms supply,
> And souls are ripened in our Northern sky."

But is it not true in history that the barren and inhospitable regions have been saved from enslaving conquest by their lack of attraction to the conqueror?

In Gibbon's first volume it is related that Scotland did not feel the yoke of imperial Rome because of her rough climate. The

native Caledonians were indebted for their independence rather to their poverty than to their valor. "The masters of the fairest and wealthiest climates of the globe turned with contempt from gloomy hills assailed by the winter's tempests, from lakes concealed in blue mists, and from cold and lonely heaths over which the deer of the forest were chased by troops of naked barbarians." The boasted liberty of the Swiss has been due to the inaccessible and repellent nature of their glacier-clad Alps, while the sunny slopes of Italy have been the scenes of war and rapine.

"Italia! O Italia! hapless thou
Who didst the fatal gift of beauty gain;
A dowry fraught with never-ending pain,
A seal of sorrow stamped upon thy brow!"

The great calamities that came upon mankind early in our era, when the civilization of the world was overwhelmed by barbarians, were caused by the armed immigration of the Northern races seeking a better country. They came not as armies, but as moving peoples. They had with them all that they loved and all that they possessed: their Dacian women, their young barbarians, their troops of Scythian cavalry, their herds of coarse, rough-haired cattle; their homes were where they encamped. They left their Arctic allegiance behind; they exchanged with gladness the waters of the Don and the Volga, murmuring under imprisoning ice, for the sunny slopes of the Arno, the Rhone, and the Guadalquivir. They left the gloom of Northern forests, the dark shadows of fir and birch, for the fruitful groves and vineyards of Italy.

The causes of the emigration that commenced a settlement upon the stern coasts of Massachusetts at the beginning of winter, when December winds howled through the forest and tossed the freezing foam upon the rocks, were not similar to those I have described.

"No lure of conquest's meteor beam,
Nor dazzling mines of fancy's dream,
Nor wild adventure's love to roam,
Brought from their fathers' ancient home,
O'er the wide sea, the Pilgrim host!"

A thirst for freedom of the soul, freedom of thought, and a larger measure of freedom of life, — a desire that two centuries had been kindling, and which had to be satisfied, — led to the reckless

attempt which, pursued with so much of suffering, destitution, and misery, almost perished in the New England wilderness during that first winter, but which *did* live to found a colony and a nation. They took no thought of climate, — they lived but to die, — their vision looked beyond the dreary shore of Plymouth to that perfect climate,

> "Where everlasting spring abides,
> And never withering flowers;"

and they bore without complaint, but with much home-sickness, the fierce extremes of their new home. There is no record by thermometer of the first hundred years of the occupation of New England, as this simple and necessary instrument was not made practically available until the beginning of the eighteenth century, so that we have no knowledge of the degree of heat they experienced, but we do know from their records that in one respect the climate has changed but slightly since then, — that *drought* was an ever-present menace to the struggling colonists. The experience of their earliest planting also shows that unacclimated English plants could not bear the fervor of our sun; for, of the six acres of barley and peas put in, not only with faith, hope, and prayer, after the Christian manner, but, as a precautionary measure, well manured with fish, after the heathen Indian style, the barley was indifferent good, and the peas not worth gathering; they came up well and blossomed, but the sun parched them in the blossom, and the hope of the Pilgrim husbandman was frustrated. Their first summer was undoubtedly very early, for they began tillage in March, and it was very hot.

Subsequent seasons were later, and the English garden seeds yielded abundantly; for we have the enthusiastic testimony of the Rev. Francis Higginson, who, in 1629, wrote, "Our Governor hath store of green pease growing in his garden, as good as I ever eat in England. Our turnips, parsnips, and carrots are bigger and sweeter than is ordinary to be found in England; here are store of pompions, cowcumbers and other things of that nature which I know not."

Probably there has been little change in the climate; the forest was not so all-pervading as writers have usually assumed, — there was much clear land, and the Indians burned over great tracts, the fires running until material was exhausted, or rains quenched the flames. Now, as then, winter prevails the greater part of the

year. Early in September the gardener expects frost; later in the month the low lands are hoar with rime. October, with bland, charming days, has a killing night breath. November ends even the show of vegetable life, and thenceforward, "a leafless branch his sceptre, winter rules the inverted year."

Though we have our open and mild winters at long intervals, the mean temperature is below 32°, with frequent sudden ranges below zero. In this period of intense cold, the streams are locked in thick-ribbed ice; the ground, often bare of snow for weeks, freezes to a depth of three or four feet; there is no sign of life in herbaceous plants, and the loosened winds howl o'er the pendent globe. Nor does the scene assume the beauty that belongs to vegetable growth until late in the spring; usually "Winter lingering chills the lap of May." Summer comes with June, and though it has been asked, "What is so *raw* as a day in *June?*" — from the advent of our divine month there will be one-quarter of the year without frost; nature is often yet more benignant, and we have four months of warm weather.

With this climate we have a thin, hard, stony soil; the few plants necessary for the support of man (for of the thousands known to botany he uses scarcely a hundred) perish in winter, and must be continually renewed from seed, or by the preservation of their roots, bulbs, or tubers.

Our summer, though all too brief, is hotter than in the tropical or equatorial region of our continent, and favorable to the growth of any plant that will mature within ninety days. Plants of warm regions that, introduced here, endure the inclemency of the winter, we call "hardy," and adopt them into our flora.

Science has labored in vain to determine why one plant endures severe cold without harm, and another withers and perishes. An inhabitant of the tropical world, stumbling over the rocks firm set in the frozen surface of a Massachusetts pasture, or floundering in the snow-drifts of a swamp darkened by hemlock boughs, and gaunt with the bare limbs of birch trees, would start with amazement to see the glossy, dark leaves of evergreen kalmia or rhododendron, so like the tropical foliage of lemon, orange, or cacao. If he cuts the wood, he finds it, like them, hard and fine of grain; the imperceptible, unexplained difference in character being in the power to live through the winter. This remarkable difference is also noticed in bulbs and tubers; but as yet unaccounted for.

Our cold winter does not exempt us from the introduction of

pestilent weeds that are by nature hardy and cosmopolitan, and that, taking advantage of the exchanges of agriculture, travel about the globe, unbidden guests, with such vigorous aggression that their extermination, in our methods of culture, seems impossible.

Our fervent ninety days of summer, though not enough for the great majority of tropical plants, enable us to make gardens that in edible richness surpass the prodigality of the tropical world; albeit the plants which we there produce, — that minister so much to health, comfort, luxury, or actual necessity, — have been introduced to our use from the far South.

The vegetable contributions of the New World to the Old were from the regions of tropic warmth. The maize, or Indian corn, though spread by savage necessity to the extreme limit of cultivation at the time of the discovery of America, was a child of the sun. Tobacco, the ubiquitous solace of life; the potato, that has enabled the world to sustain its population so easily; the tomato, chocolate, quinine, and an infinite variety of tropical flowers, were furnished from the boundless resources of the equatorial world. Imagine a pharmacopœia without quinine, — a malaria-infected world without its remedy, — people whose *un*embittered existence should be shaken and racked with chills and fever, and no antidote!

When our fathers landed upon the shores of Plymouth they could form no idea of the flora of the region. Those who lived to see the miracles of the New England spring were filled with glad surprise at its sudden beauty. They gathered with delight, first, the lovely arbutus; later, the pale, single roses of the forest. When the wild grapes blossomed, charming the vagrant breezes with fragrance, and their broad leaves unfolded, they knew why the Norseman, skirting these shores in summer, had called it a Land of Vines. Then they reddened their fingers with the wild strawberries, and told thumping stories about them in letters home, — travellers' tales, such as, that "ships might be loaded with their abundance."

It is necessary for man to plant seed and till the soil, even in savage life. I take it that the New England Indians were no mean farmers, and that their agriculture was quite extensive. The Pilgrim watched the squaw preparing the ground cleared by fire upon the banks of a stream; her simple hoe, a clam shell or shoulder blade of deer, tied with thong of hide or muscle to a stick. They worked their land near the water, to be convenient

to the great store of herring or shad, and in the mellowed earth they put one or more fish, and dropped the golden grain of maize; the Pilgrim saw its blades of tender green seek the light and shoot upward with tropical vigor, color, and form. The grass grains of the Old World, waving in billowy richness, were the types they knew. Wheat, rye, and barley, ancient as our race, and making the staff that has supported the toiling steps of every generation of men, were familiar to them. What must have been their surprise when they saw this child of savage horticulture respond to the ardent kisses of the sun, spread its broad leaves, exalt its towering blossom, shed its fertilizing pollen, and ripen its prodigal grain!

It was their wonder and their safety; it was God's gift and mercy that by it, upon these rugged shores, they might live, and that the wandering witness of his word should be preserved and established, — a proof of his lasting love and watchful power.

This bantling of the Indian squaw is now the king of all the cereals; whose field is a continent, and whose surplus loads the boards of nations that would otherwise perish. This very season the American farmers have raised in ninety days eighteen hundred millions of bushels upon lands that stretch from the sandy shores of Plymouth to the gate of the Pacific, and from where the cool streams leap to the untempered waters of the North Atlantic to the turbid tide of mighty rivers dark rolling to the Southern Gulf.

The maize was the only useful plant of the family of grasses that the English settlers found in their new home. The tame grasses of Europe that now wave in our meadows, the cereals, roots, and fruits of civilized life, had to be carefully introduced, supported, and cultivated, to form the wide basis of our present agriculture and horticulture.

The native flora of New England was not sufficient for the support of man. There was game in the forest, and fish in the streams and waters of the coast; but timber, ice, and rocks were the sole productions of the shore. May I not say that there was not a wild plant of all our region that has ever been cultivated into value, from the time of its discovery until now? It may perhaps be proper to except several small fruits, and also to speak of the sugar maple, one of the most beautiful of our native trees, readily transplanted or raised from seed. It is of vigorous growth, its foliage clean and rich in summer, and when ripened in autumn gorgeous in varied colors. While yet the snow-drifts lie heavy in the wood,

before the blue-bird — harbinger of spring — is heard, it may be tapped, and its sap, identical in composition with the juice of tropic cane, produces a peculiar sugar well known to us all. I have tasted it when sent to me in foreign lands, and its wild flavor has so brought back the odor of the forests of my native hills, that, sick for home, I have stood in tears upon the alien strand.

The natural emigration of plants is to kindlier soils, or to those climates that offer favorable conditions of growth. The most remarkable case of emigration is that attributed to the Cocoa Palm. Its original country is supposed to be Ceylon, where, on the coast of Colombo, there are vast groves, scarcely interrupted by other trees. These forests of palm are of immemorial antiquity; from this, or from the similar coast of Malabar, the great nut, falling into the water, is borne on the currents of the Pacific. Its germ of life and the albuminous matter within are protected by its rough shell; it may float for months, perhaps for years, until washed by the surf upon the sand of a coral island; here it sinks into the sand — in darkness, moisture, and heat; it swells, sprouts, and grows; the albumen of the inner shell nourishes the root; it begins as a single leaf, and at length it stands a mighty column, taller than the mast of a great admiral, bearing aloft the glory of its leaves and its centre of continuous flowers, the crowned monarch of the vegetable kingdom. Thus has the palm been distributed to all parts of the tropical world reached by the currents of the ocean.

Seeds that are winged are carried by the wind, that bloweth where it listeth; others are disseminated by birds. Some attach themselves to the hair or fur of animals, and so move about the world. We cannot tell why, when we cut off a forest of pines, oaks spring in their place; or why, from fallow lands, a forest of walnut should be evolved as from the inner consciousness of the earth. Our Massachusetts soil probably received all its share of plants that would survive upon it; it was kind to a rich variety of arborescent species, its flora containing a larger number than any other region of similar extent in the north temperate zone. The Appalachian flora, in which ours is included, has in a comparatively small area twice as many species of trees as grow naturally in all the Continent of Europe; but if the cocoa-nuts floated on ocean currents reached our chilly shores, they never remained over winter. Our fathers soon found that the earth yielded its increase only to the hand of toil, and set themselves early to the great

work not only of planting a nation in the wilderness but also of providing food for its maintenance.

At this time grasses were not cultivated in England, and the wild herbage served here, as in the British Islands, for the cattle that were imported in considerable numbers shortly after the settlement of Plymouth. Wheat, rye, barley, beans, carrots, parsnips, and turnips were soon introduced, and added to the corn, squashes, and tobacco of Indian agriculture; so that in 1629 planting and gardening became the boast of the colonists, who wrote back to England: "Wee abound with such things as, next under God, doe make us subsist; sundrie sorts of fruits, as musk-millions, water-millions, Indian pompions, and many other odde fruits that I cannot name."

Later botanical investigation revealed further natural richness without "the art or helpe of man," in the existence of "Purselane, Sorrell, Peneriall, Yarrow, Mirtle, Saxafarilla," and though, in their boasting, they would have included the nauseous chokecherry as yielding clusters of cherries like grapes, they confess that the acrid juice did so "furre the mouth that the tongue did cleave to the roof thereof, and the throat wax hoarse with swallowing them." Their idea was, in such cases, to tame the fruit, which was wilder than the Indian himself, and in this direction we see the best effort of the horticulturist.

The slow process of pomology began when Governor Winthrop planted the seeds of Pippins on an island of Boston harbor, which grew, and gladdened the sight of the Puritan with blossoms that Eden knew, and in 1639 on the 10th of October, there were ten fair pippins, fruit of that seed, "there not being one apple or pear tree planted in any part of America except on that island." The next year Governor Endicott commenced a nursery of seedling trees at Salem, and, trees being scarce, and land plenty, he exchanged trees for land, — two young trees for an acre. Peregrine White, himself the earliest fruit of Plymouth shore, planted apples, and indeed the whole colony was fully alive to the importance of apples. Quantity was desired rather than quality, the purpose of planting so largely being to make "Syder," to which our pious ancestors were greatly addicted.

The desire of the Puritan, distant from help and struggling for bare existence, to add the Pippin to his slender list of comforts, and the sour "syder" to cheer his heart and jog his liver, must be considered a fortunate circumstance. Perhaps he inclined to cider

for the same reason that the Chaplain of Newgate, in Jonathan Wild's time, gave for his love for rum punch, — "because it was nowhere spoken against in the Scriptures." He found a new home for the most useful fruit that has been given to man, and a soil and climate that have improved its quality and increased its value beyond any possible expectation of the earlier cultivators. Pears were not neglected: the trees of common, heavy bearing varieties grew to great size in large orchards, the fruit being made into perry, — another species of "red-eye," now happily forgotten. It may be noted that the canker-worm was waiting for the advent of the apple, and the curculio was in ambush for the plum.

This cider interest may perhaps explain the fact that no nurseries of improved grafted fruit were established in New England until our time. The seedling trees must have grown with great rapidity and produced enormously, trees making seven to nine barrels of cider being common in all orchards. Villages of forty to fifty families made from two to three thousand barrels of cider; every cellar was full of it; it was drunk, sold, given away, and there were "woes and babblings" in consequence.

On Long Island, the Linnæan Botanic Garden of the Prince family, at Flushing, was commenced in the middle of the last century. Here were splendid collections of foreign and native fruit and ornamental trees. There were other nurseries on the island; also in New Jersey, Pennsylvania, and South Carolina, and gentlemen of this neighborhood had to send there, or to England, for trees. In 1822, John Lowell, writing in the "Massachusetts Agricultural Repository," vol. vii, p. 137, said: "We are utterly destitute in New England of nurseries for fruit trees on an extensive scale. We have no cultivators upon whom we can call for a supply of the most common plants of the smaller fruits, no place to which we can go for plants to ornament our grounds. We have not a single seedsman who can furnish us with seeds of annual flowers upon which we can put reliance." A year later he wrote in the same journal complaining that, "A traveller may traverse Massachusetts from Boston to Albany and not be able to procure a plate of fruit, — except wild strawberries, blackberries, and whortleberries, — unless from the hospitality of private gentlemen."

The Massachusetts Society for Promoting Agriculture had been established in 1792, by wise, public-spirited, generous gentlemen. It became a beneficent institution, and still flourishes in a youth that I trust may be immortal. The value of its assistance to the

general agriculture of the Commonwealth cannot be over-rated, and it is always on the alert to give practical assistance to the farmer.

In 1801 this Society gave $500 for the establishment of a professorship of Natural History at Cambridge, and a committee was appointed to procure subscriptions for its permanent endowment. This resulted in the establishment of the Botanic Garden connected with the University, and was one of the causes that led to the formation of the Massachusetts Horticultural Society in 1829. From this time the pursuits of gardening and pomology took their rise, — evidences of increasing taste and a more refined civilization.

"The garden," said Lord Bacon, "is the purest of human pleasures; it is the greatest refreshment to the mind of man, without which buildings and palaces are but gross handiworks; and man shall ever see that when ages grow to civility and elegancy, men come to build stately, sooner than to garden finely, as if gardening were the greater perfection." It is a pursuit alike adapted to either sex; it is the relaxation of genius, a refuge from the toil of commerce and the cares of state.

Think what it adds to the refinement and luxury of life. Look back in the records of fifty years, or examine the recollection of each one here present, and see how small and poor was the list of fruits and their varieties; and those were confined to the gardens of the wealthy. Now I may say that, in my annual visits to the agricultural fairs, I see, each year, in remote towns of the Commonwealth, exhibitions of fruit and flowers such as the whole nation could not have made in my boyhood.

The grape — the type of luscious fruits, the inspiration of poetry, the adornment of eloquence — is but of yesterday in our cultivation. It is but about sixty years since valuable American varieties were first brought into notice; now we have numerous seedlings and hybrids brought into our market by the ton from our own vineyards, and sold as cheaply by weight as apples.

About the same time that this work began the berries were confined to the wild varieties of the woods and the fields. We have only to go back to 1839 to find on the record that then was first exhibited the Hovey's Seedling strawberry, which so stimulated the emulation of gardeners; and the splendid variety originated by President Wilder, with its surpassing flavor, was not given to the world until 1865. Now the list of that noble family is as long as the British peerage.

What time is left me, to speak of the progress made since the foundation of this Society in the cultivation of flowers! What great proportions do we see in the trade of the florists! What an increase in the taste of the people! How flowers are taken to decorate every scene of the drama of existence! How bare would the world seem without the refinement of their presence! Our feeling for them is fitly expressed in the language with which Eve, when expelled from the forfeited garden, mourns with deepest tenderness: —

> "O flowers,
> That never will in other climate grow,
> My early visitation, and my last at even,
> Which I bred up with tender hand
> From the first opening bud, and gave ye names!
> Who now shall rear ye to the sun, or rank
> Your tribes, and water from the ambrosial fount?"

Discussion.

At the conclusion of Mr. Russell's remarks Benjamin G. Smith moved a vote of thanks to him for his eloquent address, which was unanimously passed.

Charles M. Hovey was called on, and expressed himself as much pleased with the *résumé* of the progress of gardening in New England, which had been given. He agreed with Mr. Russell that there have not been any great changes in the climate since the first settlement was made in Massachusetts by the Pilgrims. We remember only the extraordinary seasons, and hence our impressions of changes are erroneous. Forestry is now attracting much attention, and the planting of forests is urged as a means of preventing droughts. But drought, as remarked by the lecturer, was an ever-present menace to the Pilgrims before the forest had been cut off, as it is to us today. We must go on in the practice of gardening, not expecting any change for warmer or colder.

F. L. Capen was struck with one point mentioned by Mr. Russell, — that the Indians were in the habit of burning off the forest, and he thought this might account for the droughts experienced by the first settlers. The subject of sewerage and fertilizers is of great interest. Many towns are barren and unproductive; and if farmers cultivated the ground better they would not be obliged to cultivate so much, and they could then

devote more attention to forests. If all the fertilizing material were saved we might cultivate forests that would vie with those of California.

Leander Wetherell had been much interested in the remarks on drought. The clearing of our forests seems to have a decided effect on our springs and streams of water in time of drought, making them dry up more quickly; but the average rainfall does not vary from year to year as much as is generally supposed. Cutting away the forests allows the water to escape more rapidly.

The Indians were mainly hunters, and not corn-growers to any large extent, and they burned off certain areas to give the squaws an opportunity to cultivate the ground, but not enough to destroy the hunting. The speaker had kept a meteorological register, but had not been able to see any change in the climate from cutting off the forest. There seems to be a wide difference among writers as to the connection of drought with the clearing of land, but all are agreed that forests retain water and prevent springs from drying up. Farmers will not apply fertilizers to forests until they have more than enough for other crops. The farmer who plants in well-tilled soil, and takes good care of his crops, will, now as heretofore, be successful.

Robert T. Jackson said that if all the trees are removed from any region the rains will run off in a few days, and evaporation will be more rapid, and if the forests cut away were sufficiently extensive the climate will be changed. Climate is much affected by the ocean currents. The western shores of the Atlantic are much colder than the eastern shores in the same latitude; the climate of Labrador, for instance, is much more severe than that of the British Islands. The temperature of Newport, R.I., is ten degrees higher than that of Boston, and the season is three weeks longer. The Irish yew will flourish there, and the waters contain many marine animals not found north of Cape Cod. All these differences are due to the Gulf Stream, which warms the adjacent countries.

Hon. Marshall P. Wilder said that the influence of climate on all animal and vegetable life is such that a thorough knowledge of it is necessary to success in cultivating plants or breeding animals. He expressed his deep interest in the welfare of the Society, which lies very near his heart, and in promoting the interest of these meetings. Such discussions are the great improvement of the age. This Society has exercised more influence than any other horticult-

ural society on this continent. Mr. Wilder congratulated the President on his inauguration, and hoped that all the days of his administration would be as bright as this day.

Col. Henry W. Wilson said that the matter of the climate lies at the foundation of all things; it must be considered in planning a house or a garden. There has been a good deal of speculation as to the effect of forests upon climate. Many assert with emphasis that the recent irregularities in rainfall are due to the destruction of forests; and yet there is now more forest in Massachusetts than ever before within the memory of man. One town has five thousand acres more than seventy-five years ago. There is a difference in the character of storms. In some years we have drought, notwithstanding a great rainfall, and in others a meagre rainfall and no drought. The extraordinaries remain fixed in our minds. There are places on the earth where the planting of trees has seemed to be followed immediately by increased precipitation of moisture. The rainfall in Massachusetts has increased ten per cent in forty years; in the last ten years it was ten per cent more than in the first ten years of the last forty. In Utah the rainfall has increased ten per cent; in the Central States the increase has been eight per cent in the same time. It is idle to speculate on causes when the facts are not fully known; the result can only be a distortion of facts to support some pet theory; and no man succeeds in any scientific investigation who mounts a hobby. It is warmer in England than here; but the fruits there are not equal in flavor to ours, because the summers are cooler and the winters are warmer. Planting forests increases the retentiveness of the soil; the ground is spongy, and the water passes away slowly. Thus the woodlands may be made to be great natural reservoirs upon the hill-sides for our future water supply. Snow-drifts remain in the forests longer than on the open ground. There are thousands of acres of land in this State which somebody has got to cover with forests. We get, on the average, sufficient precipitation of moisture, but some years there is too much and other years not enough.

William T. Brigham presented, on behalf of his brother, Charles B. Brigham, M.D., of San Francisco, Cal., a photograph of double and single Tuberous-rooted Begonias. Dr. Brigham has a great variety of these plants, having collected every kind that he could procure. Some are like double almonds, and others like small white roses, the colors being as various as the forms. The thanks of the Society were voted to Dr. Brigham for the photographs.

O. B. Hadwen, Chairman of the Committee on Discussion, expressed the gratification of the Committee at the attendance at this first meeting of the season, and announced that on the next Saturday, Col. Henry W. Wilson would read a paper on "Mulching."

BUSINESS MEETING.

SATURDAY, January 10, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

David Nevins, of Framingham, was proposed by Hon. Marshall P. Wilder as a Life Member of the Society.

The Annual Report of the Committee on Gardens was read by John G. Barker, Chairman, accepted, and referred to the Committee on Publication.

The Secretary read a letter from M. Ch. Joly, of Paris, a Corresponding Member of the Society, inviting contributions from the members of the Society to an International Exposition of Horticultural Products, at Paris, May 20–31, of which M. Joly is president. The subject was referred to the Executive Committee.

The Secretary also read a letter from the New England Meteorological Society asking the coöperation of horticulturists and others in the work of establishing a system of simple meteorological observations throughout the New England States.

Adjourned to Saturday, January 17.

MEETING FOR DISCUSSION.

SOME CONSIDERATIONS REGARDING THE PRACTICE AND UTILITY OF MULCHING.

By Col. HENRY W. WILSON, Boston.

Some months since, at a general discussion of agricultural matters, a gentleman of experience and reputation as a cultivator

confessed to a lack of practical information upon the subject of mulching, and expressed a wish that some one might give light upon the subject.

Without presuming to be able to add anything to what has previously been uttered, or to furnish any great amount of light, the writer can give the result of a good deal of reading, considerable observation, and some practical experience in the matter from twenty to twenty-five years ago, together with his deliberate conclusions derived from these sources.

Mulching was tried by him as thoroughly and fully as it could be by anybody, with vines, fruit trees, shade trees, strawberries, and raspberries; and the outcome of it was just what it will continue to be with each successive generation as it comes along and gets its experience in the old-fashioned, practical way.

More recently but little has been said about this subject; and, at the risk of repeating much that many are familiar with, the writer has summarized what seemed of interest to him while he was enthusiastic over the matter, that those to whom the subject is comparatively new may avoid useless labor and experiment.

About all of the discussions nowadays that relate to crops of any kind, before they are finished, take into consideration more or less the rainfall or drouth. One has a vivid recollection of some dry season or early frost, and as the rains descend in June and July, causing summer floods and spoiling the hay crop by an insufficiency of sunshine to cure it, he thinks that more rain falls now than when he was a boy. Another remembers with greatest distinctness an exceptional year of rains and freshets, and now there are not many years in New England when he will not think that the early and latter rains, as a rule of the seasons, are deserting us, and soon to be forgotten. Recollections of youth give but a poor means of comparative meteorology, and the most accurate observations and records of specialists in this department are often misleading.

A year of greatest rainfall may be also a year of such scarcity of moisture, at the proper season, as to be a year of drouth, while another year of less than average rainfall may be a year of fruitfulness and abundance.

In the year 1881 15 inches more rain fell in Boston than in the preceding year, and still 1881 was a year of drouth, because there was a deficiency of moisture during the months of April, July, August, and September; while in 1880 there was a deficiency

in every summer month except July, in which there was an excess of 2¾ inches, and this year (1880), with a deficiency of nearly 12 inches below the average for ten years, was a year of good harvests, although the scarcity of rain in April, May, and June, with excessive temperature, gave a light hay crop; while 1881, with a rainfall 3.43 above the average for ten years, was a year of drouth and failure of crops. I give these two years as an illustration of the fact that the record of total rainfall is no measure of the fruitfulness of the year; but we can rest pretty certainly assured of one thing, — that while, for a period of fifty years, records have shown the earth receiving an undiminished average amount of moisture and heat, still the periodical distribution is unequal and unfavorable; so that in New England we may count upon a continuance of the experience of the Pilgrim Fathers, which has come down to us with our other inheritance, — a legacy of periodical and frequently recurring drouth.

The effects of drouth are so baneful and discouraging to the cultivator that men in every age have sought eagerly to counteract it. The means employed generally correspond with the measure of the skill and experience of the times in which they are undertaken.

In the few thoughts and experiences which are here arranged there is no claim to originality or special authority; but the writer has been at some trouble to collect and summarize points which seem to be essential in the recorded observations of those who have given time and study to the subject, and which appear to cover the matter pretty well, — only this and nothing more.

One resource, toward which many have instinctively turned, is to cover the soil about the plant to be protected with some cheap and abundant material which will break the force of the sun's rays and check the evaporation of moisture with the consequent radiation of heat; this has been termed mulching.

It is one of the most natural things in the world for a reflecting man to think that, as he finds in the forest a mossy carpeting which covers the ground and keeps it continually moist, even so a similar covering in our gardens and about trees and vines would repress noxious weeds, resist the drying action of the sun or wind, and generally prove to be a very useful thing. Men argue that in the realm of nature everything seems to work about right; that checks and balances are there pretty evenly distributed, and that it is generally safer and wiser to follow natural processes.

To this end about every material that seemed suitable to cover the soil as a mulch has been used first or last; leaves of both evergreen and deciduous trees, straw, haulm, hay, both from salt and fresh meadows, rushes and sedge grass, spent tan, sand, sawdust, chips, and bristles have all been tried with a great variety of crops and an equally great uniformity as to the results.

The horticultural literature of from thirty to thirty-five years ago was occasionally flecked with the experiences of enthusiastic amateurs, and it may be of interest today to recall some of them in their chronological order.

In 1845 a gentleman of Ithaca, N.Y., planned an arbor over one of his garden walks and, in anticipation, planted eight or ten grape vines of different varieties (York Claret, Isabella, and Catawba) on the sides of the walk. Subsequently, and without any reference to the vines, he covered the walk thickly with refuse or spent tan bark from the tannery. The next year, having changed his mind as to the arbor, he removed the vines to another part of the garden, and was surprised to find that they had sent vigorous roots from one to three feet into the tan, in some instances even to the very surface, and had filled it with a multitude of small fibres, to the extremities of which small particles of bark adhered. The vines appeared to be perfectly healthy and vigorous, and the circumstance so impressed him that he afterwards continued to make a liberal use of old tan bark with success in the treatment of his vines; but, being an amateur, he omitted to mention it lest it should prove to be new only to himself.

In the spring of 1847 a hundred and fifty fruit trees were set out in an orchard having a good, dry soil; one-third of them were mulched with litter six inches deep; the season was hot and dry; of the mulched trees all lived and thrived, while of the others fifteen died.

Mr. H. W. S. Cleveland, in New Jersey, found that mulch of old chips prevented pears from cracking and seemed to impart a superior flavor to the fruit; the bark of the trees also had an increased smoothness.

Native grapes were saved from rot and mildew by mulching. In the fall it was drawn back from the stems of the vines to avoid harboring mice and other vermin.

In 1848 a writer in the "Gardeners' Chronicle" treated the subject of mulching more as a matter of top-dressing, claiming that much food is thus speedily furnished to a suffering tree. He

regarded with satisfaction the great number of surface roots which he observed to be encouraged by top-dressing, and considered them to be an evidence of permanent benefit. He deemed it one great advantage of mulching that, when, under its stimulus, the tree makes a too rampant growth, by the removal of the mulch in whole or in part, the tree may be thereby checked and subdued in its growth.

With currant and raspberry bushes the use of mulching was recommended; also the addition of five or six inches of good soil, which stimulated and nourished a strong growth of surface fibres.

In the autumn of 1848 a gentleman who had previously observed the grievous effect of drouth upon his trees planted some nuts of native forest trees, which in due time germinated, and the young trees received constant care and attention. While gathering the nuts in the fall a quantity was left in a hole in the ground, and subsequently covered with some prunings of trees. In July he observed that green shoots were forcing their way through the brush, and upon examination found that some of them had made a growth of three feet from the nut, while his carefully tended seedlings had grown only four inches. The reason for this seemed so apparent to him that he immediately forked up the soil about all of his trees, both great and small, and watered and mulched them well, but with what material he omitted to state. In two or three days new buds made their appearance; in three weeks, trees whose leaves had previously fallen made shoots nearly a foot in length.

In the spring of 1849 a quantity of fresh spent tan bark was hauled directly from the tannery, and a heavy dressing of it was put upon a vine-border; the remainder, amounting to six or eight cart-loads, was put in a heap at the distance of a few feet from an Isabella grape vine. Upon examination in the autumn it was found that the vine had sent its roots up into the tan heap more than a foot above the surface of the ground, and their fibres had spread in every direction. Never had so fine grapes been raised in the grapery as after this dressing of fresh spent tan was applied.

A writer in May, 1850, stated that he had tried mulching with all sorts of material, — straw, litter, seaweed, and whatever else he could get of a like nature, — not only upon newly transplanted trees, but also upon all kinds of garden vegetables, melons, and flowering shrubs. He seemed to think that the great advantage is with newly transplanted trees, and he had found it easy thus to

cultivate some delicate garden favorites, which had given him a good deal of trouble before he tried it. Although he was not prepared to take the ground with some that mulching is more beneficial than a coat of manure, he expressed the opinion that it is of great value, especially to the fruit and ornamental tree grower.

In 1850 an experienced horticulturist reported that he used spent tan to spade into his stiff clay soil, with good success; also as a mulching for strawberries, pear trees, and shrubs. It was free from mouldiness; and roots struck in it readily, especially runners of the strawberry.

Mulching, with buckwheat straw, pear trees that were set after being long out of the ground and very dry proved successful, when similar trees not so treated did not recover.

An orchard of six hundred apple trees, which had been planted four or five years, and had seemed to be checked in growth, was mulched four inches thick for about four feet around each tree with coarse fresh meadow hay and buckwheat straw; the effect was a good stimulation of vigorous growth, ample bloom, and enormous crops of fruit. Moss, which had begun to gather upon some of the branches, peeled up and dropped off, while the whole appearance of the orchard was entirely changed.

With strawberries the same writer had excellent results, using spent tan bark, applied two inches thick, after New Year's, to a strawberry bed that had been previously covered with asparagus haulm, and was not sufficiently protected from frost. The plants were being lifted by the alternate freezing and thawing, but the tan bark prevented further injury and gave good success.

A writer in 1851 advocated mulching trees with any suitable material as far as their branches extended; also mulching of dahlias with soft spongy meadow or swamp moss. With the same tubers planted side by side, and having the same treatment otherwise, the moss-mulched dahlias far outgrew and outbloomed the others.

The same kind of moss was used to mulch flower seed beds. With these the plan was to prepare the soil nicely and sow the seeds as usual, covering them with the damp moss, and put a flower-pot or seed pan over them, watch them carefully, and when the seeds germinated, to lift the pan little by little, until the plants acquired color and strength, when the moss was removed. This is the plan now generally adopted for the successful germination of

those seeds which require much time with constant and uniform moisture as well as warmth.

Another writer who had previously advocated mulching as a good practice, testified to his continued faith in its advantages, and said that his dwarf pear trees made masses of fibrous roots in a single season, and quite double the amount made by other trees similarly situated but not mulched. He also testified to the excellence of tan bark for strawberries.

Andrew J. Downing was an advocate for the use of tan as a mulch for strawberries, preferable to straw, litter, or leaves. A covering of two inches of tan gave good protection against frost, and the plants came out of the winter in better condition than those mulched with any other material. He had a special word of commendation for the use of spent tan bark as a mulch for newly transplanted Norway spruces.

In the South it was noted that thorough mulching was a great benefit to fruit trees which had been recently transplanted from Northern nurseries, and obviated one great difficulty in the acclimating of such trees in the South.

In December, 1847, after the ground had frozen solid, a gentleman mulched about three-fourths of his strawberry bed with some old spent tan bark that had been upon his place for eighteen months. The tan was spread evenly over the entire surface to the depth of three inches, and for three years the difference between that part of the bed and the other was very marked in favor of the application of the tan bark.

In the fall of 1850, having about one-fourth of an acre of fine strawberry plants that were put out in the previous spring, seeking to profit by his successful experience, he proceeded, just before the ground was frozen, to cover them with fresh tan bark right from the tannery. The result was quite unexpected and equally unsatisfactory, for in the spring nearly all the plants were either dead or utterly ruined, and he was greatly puzzled to know what did the damage. His only consolation was to know that a neighbor of his also lost all of his plants in the same way, and from the same cause. Another neighbor, who had for ten years used tan as a mulch for strawberries, was ready with his explanation; he attributed the loss to an excess of the tan bark covering over and around the crown of the plant. He was accustomed to use not more than a quarter of an inch in thickness immediately around the plants, but covered the rest of the surface from one to two

inches deep. He had never lost any of his plants as a result of this practice, but thought that they were greatly benefited. The only covering which he permitted to be placed over the plants in the winter was a slight litter of straw, and this was removed early in the spring, or as soon as the warmth began to stimulate the plants to growth.

Another cultivator says that one inch of tan bark is enough for a mulch; three inches will produce fermentation, and greatly injure if not kill the plants. He thinks, however, that, according to his experience, the best mulch is a highly tempered steel rake, with eight-inch prongs, applied at least once a week during the season. This conclusion is worthy of note as being the first published intimation which I have met, that *tilth* is the best method of promoting a moist condition of the soil, and enabling vegetation to endure a drouth, and this was thirty years ago.

I have here recounted the experience of horticulturists of a generation gone by, because it is identical with what is heard constantly nowadays, as men go on repeating the experience of their fathers, without stopping to inquire to what their success or failure was owing. Perhaps I may say right here, that within the last twenty years I have tried pretty much the same line of experiments, as far as they are stated, and have come to identical results.

I am not insensible to the claims that are urged, that tan bark contains more or less tannin, and that tannic acid is an element in the strawberry plant, and, therefore, a coating of spent tan is beneficial to the plant. In either wish to start anew, or to be drawn into a controversy upon this subject, on which volumes have been already written. We are considering mulching solely as a means of promoting the moisture of the soil.

I am also aware that in the culture of the gooseberry the soil in June and July seems to be too hot for the plant, and a covering of leaves seems to impart coolness to the soil, and thus obviate this difficulty; but every one who has tried this expedient has before long found all of his roots on the top of the ground, which is just where they ought not to be.

I know of a vineyard where the cultivator covered about one-half of the surface with rushes, chips, and weeds that were washed ashore on the beaches of an adjacent river. An unexpected advantage was noted, which was, that although rose-bugs were as abundant as the year previously, when a half-dozen lads gathered

a round half-bushel of the pests by hand-picking, the year that the mulch was tried but few bugs were found in that part of the vineyard, while in the other they were as thick as ever. The cunning insects seemed to appreciate the fact that this covering of the earth made a very unfavorable place of hibernation for their young, and discreetly avoided it. But here, as elsewhere, the tendency of the mulching was observed to be to encourage a rank growth of surface roots.

By the use of dry leaves, sawdust, and spent tan, cultivators have been able to maintain a moist condition of the surface of the soil, but all have noted that an abundant growth of fibrous roots was stimulated near to the surface. The immediate result of the application seemed to be all that could be desired, and to include all of the elements of success; but subsequent and repeated observations, accompanied by thoughtful reflection upon the functions of soil and vegetation, together with persistent efforts to reach the desired result by other means, have caused me seriously to doubt the value of mulching as a system to counteract the effects of drouth, except with newly transplanted trees, or to facilitate the germination of the nuts of most forest trees, and certain other seeds.

General experience has shown pretty clearly that substances which quickly decay are not to be preferred for this purpose; thus straw has proved to be more satisfactory than hay or rowen; pine-needles than the leaves of deciduous trees, and spent tan than sawdust.

There is no gainsaying the repeated experience that any or all of these materials will check evaporation, and thus contribute to the retention of moisture, but are we entirely certain of the assumed fact, that this end cannot be better attained in some other way, or that moisture is the sole or chief requisite for successful cultivation?

It is certain that, as a general condition of success, warmth is not less necessary than moisture. Any covering of the earth, although it may, by its non-conducting qualities purely, prevent evaporation, will nevertheless as surely prevent the absorption of heat by the soil, although, of course, obstructing radiation of heat previously acquired.

The warmth which stimulates vegetation in these latitudes comes from without, and by absorption. It is also inevitable that a covering which screens the surface of the earth from the action of the

sun and air deprives it of the agencies most active and useful in elaborating food for plants, and thus promoting fertility.

Few people realize what a wonderful laboratory exists in the soil; how curious, how delicate and intricate are its processes, — so mysterious that the skill of the chemist is yet as unable to rival or reproduce that which is known as it is to detect or explain the unknown.

So far as facts have been ascertained they serve to show that, even though the chemical elements of fertility are supplied in sufficient quantity, still the stimulating actions of heat, light, and air are the leading essentials of plant growth. Moisture is a contributory element after the fact, and can be either supplied or reserved in various ways. To supply it is the work of irrigation; to reserve it is the work of cultivation.

It is easy to see, with but little experience, how a mulch of any suitable substance that simply retains moisture will counteract or diminish the beneficial effects of heat, light, and air; but, for attaining the highest excellence in cultivation, we must procure the lesser benefit without surrendering the absolute requisites; and there cannot be much doubt that a mulch, while it checks evaporation, also retards the chemical activity of the soil.

If the mulching material is of a kind which soon decays it may be dug into the soil when its use as a mulch is ended. But my observation is to the effect that, if this final disposal is good for anything, it were better to have dug it in at the beginning rather than at the end.

Mulching may serve to keep the surface moist; but it will be found that the portion in contact with the ground is apt to mildew, and encourage fungous growth, which neither indicates nor promotes healthful vegetation. We are cautioned, therefore, against the use of easily decaying or fermenting substances. A careful examination of the under surface of most of these mulchings will also develop the fact that it is a snug harbor for slugs, snails, worms, and all minor sorts of vermin, — at least that has been my experience.

On the other hand, if the material is one which cannot be beneficially or properly dug into the soil, after its use as a mulch has ceased, such as tan, sand, or sawdust upon light soils, then the labor of spreading and afterwards gathering and removing it is by no means inconsiderable.

A coating two inches thick on an acre amounts to about three

hundred single loads of stuff, which must cost, at least, fifty or sixty dollars to spread and remove. How many times could you go over an acre, with a cultivator, for fifty dollars? Certainly more than thirty.

It has been always observed and mentioned by experimenters that the use of mulching induced a profuse growth of fibrous roots to push up to the surface in their search for moisture and nourishment, more particularly and decidedly when the mulch contained nitrogenous matter, or other elements which stimulated the growth of the plant.

It is also not a little remarkable that none of those who have recorded this fact so repeatedly have noted that this is not a useful result. As a permanent condition of a plant to enable it to resist all the vicissitudes of our climate, its feeding roots should be below the surface; and although the ill effects of their being too near the surface may not be so apparent in those crops which are annual as they are with the strawberry, yet with all plants of a permanent character, such as vines or fruit trees, the pushing of these fibres to the surface should be discouraged.

Vegetation should be encouraged by all means to go downwards for its moisture, wherever it may ramble for its nutriment.

The roots of the strawberry and clover have been traced five feet below the surface, and the grape root has been found at the depth of eleven feet. They will always descend in search of moisture to the depth at which the ground waters stand in the soil during the season of greatest activity and growth. Wherever the air can penetrate the earth depend upon it that a root will find it out and follow.

How can the temporary advantages of mulching be otherwise attained permanently? A little thoughtful examination will indicate the answer. Careful investigation of the condition and mechanical effect of heat and soil upon moisture develops the fact that, except when the rains are replenishing the earth, moisture is continually ascending in the soil by the process of capillary attraction, to be absorbed at the surface by the air with which it comes in contact.[1] In a well-cultivated field, not more than from one-tenth to one-eighth of the rain that fell upon the soil finally passed off by per-

[1] In England, during ten years' observations, only 43.4 per cent of the rainfall percolated into the soil and passed away through the drains; while 56.6 per cent was accounted for as evaporated from the surface of the uncultivated soil. With cropped land the evaporation was yet more considerable, varying with the crop.

colation; the remainder was drawn to the surface and evaporated by the process described; or contributed to the support of vegetation. The natural tendency of earthy matter thus to raise water is not generally appreciated, but can be readily seen when so dry and porous a material as coal-ashes is deposited upon a slightly damp surface. Although the heap be quite large, yet, in a short time, I have observed the dampness to have penetrated through the entire mass from below. Anything that breaks up the uniform continuity of the texture of the soil, by which atom after atom of water is brought to the surface, will accomplish the first step in retaining the moisture of the soil, under conditions favorable to vegetation.

Now mulching does not do this at all. It only checks or moderates the approach of the atmosphere to the moistened surface of the soil, and therefore retards evaporation to that extent; but the reason why there is always so much moisture beneath the mulch is because the capillary action of the soil elevates the water to the surface faster than it can evaporate.

Any material of loose texture that is a good non-conductor of heat will, when applied to the surface of the ground, retard the movement of the air and prevent evaporation.

Spent tan bark meets this requirement better than any other material that can be applied to the land. It is light and porous, and therefore retains a cushion of confined air, which is one of the best non-conductors in nature. The gentle showers, which simply moisten the earth, pass through it readily, as do the heavier rains, which are absorbed and longer retained.

Now dry soil is likewise an excellent non-conductor, made doubly such by being loosened and pulverized, and thus intermingled with air. This is precisely the condition of the soil after a thorough cultivation; when thus rendered fine and light the surface becomes truly a cushion of air and dry earth, the continuity of the insensible process of convection of the water of the soil is broken, the point at which the upward passage of the water of the soil ceases is removed to the depth of the cultivation, the free access of the air to the continuously moist surface is hindered, and you have accomplished all of the beneficial effects of mulching in a cheaper, more intelligent, and scientific manner.

Years of observation and considerable experience have indicated clearly that the best mulching is the hoe, or the rake and cultivator.

Many an observant farmer has borne his testimony to the suc-

cess with which he has carried his cornfields through a drouth, when those of his neighbors have withered, by simply keeping the surface of the soil mellow with repeated cultivation. The surface was thus kept in a condition perfectly fitted to absorb the falling rain, whether it came in a shower or a storm, and after each fall of rain, as soon as the surface became dried, it was again pulverized by the rake or cultivator, and thus brought into precisely the favorable condition before described.

Surface irrigation has not succeeded with the grape for the same reason that mulching cannot permanently, because the tender roots are drawn too much toward the surface, and are thereby in peril of injury from atmospheric changes.

Cultivation, on the other hand, suppresses weeds, obviates the tendency of the fibrous roots to come too near to the surface, keeps the plane of the moist earth covered always with a non-conducting mixture of dry soil and air, and thus facilitates the free admission of the atmosphere to carry on those combinations with and among the elements of the soil which are so essential to perfect success.

The best kept and most fruitful vineyards which I have ever seen were those in which the best tilth was manifest.

This was notably apparent at the visit of the Committee on Gardens to the vineyard of our honored President last September. The whole surface of the ground was as light and smooth as the liberal allowance of gravel stones would permit; not a weed was to be seen anywhere, but every indication of the master's belief that cultivation means stirring the surface of the soil thoroughly and often.

High tilth is by many regarded as a sort of a substitute for irrigation, and has proved successful where ordinary care and cultivation have failed.

Let me not be understood to say that there are not times when a mulching around newly planted trees, or with some small fruits, may be found of temporary benefit and therefore satisfactory; but it does seem to me, from an observation of the experience of many men in many places, during many years, as well as from thorough personal experiment under a great variety of conditions of heat and rainfall, that mulching is but an indifferent substitute for tilling the soil, and that an industrious man, with the rake or cultivator, will obtain vastly more satisfactory results by their diligent use than the disciple of mulching will with his mulch.

Discussion.

Hon. Marshall P. Wilder was called on, and said that Col. Wilson had fully covered the subject. Thoroughly stirring the surface of the soil enables us to avoid the danger of injuries by injudicious mulching. Tan has the tendency mentioned by the essayist, to draw the roots too near the surface, and other materials are more or less objectionable for the same reason. The young rootlets are liable to injury by frost if too near the surface. Another objection to mulching is the production of weeds by the use of improper material, such as hay. The speaker uses rowen or aftermath for mulching his strawberries, covering the ground not more than an inch deep, so as to permit the access of the sun and air. The short clippings of lawn grass form one of the best materials for mulching. There is an advantage in mulching, whether by fine soil or otherwise, but the former is the cheapest and best way of effecting the objects aimed at. It should be remembered that all the food of plants must be in a soluble state, and hence the necessity of retaining in the soil the moisture which percolates into it.

George A. Tapley said that when he began planting young pear trees, years ago, he mulched nearly all over the ground; but one dry day his mulching took fire, and, though he saved his buildings, he lost some of his trees. After that, he discontinued mulching and took up thorough cultivation and fine tilth instead, and had had no difficulty since.

William D. Philbrick stated that the currant and gooseberry, as well as the raspberry and blackberry, are much benefited by mulching: they like a cool, moist soil; while the grape, which needs all the heat of our summers, and more, does better without mulching. As a general thing the action of the cultivator is better than mulching.

Leander Wetherell mentioned some instances where mulching had been extremely beneficial. In one garden which he knew, where the soil was gravelly, trees were preserved by mulching. Capt. Pierce, of Arlington, who was called the "King of Orchardists," used to mulch under his Williams apple trees just before the fruit began to fall, and afterwards raked up the material for other purposes. The editor of the "Rural New Yorker" mulches his potatoes about two inches in depth with swamp hay run through a cutter. The best mulch is the free use

of an iron rake, with long, sharp teeth; if this plan is pursued the roots will feed where they ought to feed. Deep culture has a favorable effect in preserving a crop from injury by drought.

Benjamin G. Smith said that all good cultivators agree as to the benefit of stirring the soil, but in some cases mulching may be of service. He used sand as a mulch under his apple trees, and they appeared to be benefited by it. It is clean, and does not harbor insects or seeds of weeds, does not bake after rain, and is not in danger of fire. It is especially valuable on strong clay or heavy loams. Mr. Smith quoted, from the "Report of the Michigan Pomological Society" for 1876, pp. 104, 105, 162, 163, passages concerning the best and worst materials for mulching.

William H. Hills said that he was in the nursery business years ago, when mulching was generally recommended, and he is still of the opinion that sometimes it is very valuable. In setting young pear trees, with few fibrous roots, he mulched with good effect, and sheltered the stems of the trees from the sun with paper. Since then there has been a change in theory and practice with regard to mulching. Some recommend heavy mulching and others light. The most serious objection to it is the drawing of the roots to the surface, so that when the mulch is removed they are liable to injury in an unfavorable season. The only question is whether we can get along without it; in most winters we can, for a good covering of snow is the best mulch. Hay from the salt marshes, which he gets boated up the Merrimac river, never brings in foul seeds, but swale hay does, unless cut very early, and the produce of the seeds will grow even on high, dry land. Small fruits ripen in the season when most liable to suffer from drouth, and consequently are much benefited by mulching. It also protects strawberries from being soiled.

Mr. Smith said there are cases where mulching is an absolute necessity. He covers the ground between his rhododendrons and azaleas with forest leaves, which are never removed, but added to year after year.

Mr. Hills asked, What is the objection to applying mulch to a strawberry bed in autumn and removing it in spring?

Mr. Wilder said that a winter covering is not properly a mulch. He covers his strawberries with aftermath in autumn, takes it away in the spring, and replaces it when it is necessary to keep the fruit clean.

President Moore said that a covering in the fall is not a mulch

but protection. He always removes such a covering in the spring.

Col. Wilson said that in his paper he studiously avoided all reference to winter protection, for that is an entirely different thing from mulching. In California the farms and vineyards are not cultivated as with us; cultivation is something that they do not fully understand there, but where it is practised they obtain the best results. He got his best ideas on cultivation as a substitute for mulching there. Anything that mildews is bad for mulching. The best material is that which, while keeping the ground moist, affords the freest and most perfect circulation of air.

Mr. Wilder said that he felt great pleasure that these meetings are continued, bringing horticulturists together to compare their experiences. The lecture today is a most satisfactory explanation of the philosophy of mulching.

O. B. Hadwen said that all present were delighted with the essay, which is on a most important subject. It might be advisable to mulch dry, gravelly soils when it would not do for strong, retentive soils.

Mr. Hadwen, as Chairman of the Committee on Discussions, announced that on the next Saturday Avery P. Slade would read a paper on "Forestry."

BUSINESS MEETING.

SATURDAY, January 17, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

No business being brought before the meeting, it adjourned to Saturday, January 24.

MEETING FOR DISCUSSION.

FOREST TREE PLANTING.

By AVERY P. SLADE, Somerset.

The subject of Forest Tree Planting on worn-out lands, though to a limited extent familiar in practice, does not receive that attention which its importance demands. The interest recently

awakened in the public mind in regard to the depletion of our forests may be regarded as a sufficient apology for inviting your attention to the topic announced.

Some one has estimated that no less than 100,000 acres of wood and timber lands must be cleared daily to supply the demand for fuel and for the various industries of the country, to say nothing of the vast amount that is annually destroyed by forest fires and decay. This demand would necessitate the yearly cutting of 31,200,000 acres, an area somewhat larger than the State of New York. From this fact we are in a measure enabled to comprehend with what rapidity our forests are disappearing.

If the removal of the forests changes the meteorological conditions of a country, or if the amount of rainfall in a given territory is in some degree proportional to the area covered by forest, the subject assumes an importance which cannot well be overrated. I think it is stated that Prussia, relying on the correctness of this hypothesis, requires, by legislative enactment, that for every tree felled two shall be planted. While the Legislature is powerless to stay the axe of the woodman, it might yet do much to encourage the planting of forest trees, and might thus in some degree avert the evil consequences which must surely attend the final or even partial destruction of the native forest.

Pasturing exhausted soils, or cropping them with rye, yields but a poor return; and nothing has a more demoralizing effect on an agricultural community than the cultivation of large areas with very small profits. There are thousands of acres in Massachusetts which really yield no profit to the cultivator, but which, if planted with White Pines, at a trifling expense, would pay a reasonable rate of interest on the investment; and this planting would speedily convert large areas of unproductive land in Eastern Massachusetts into delightful groves, adding a positive beauty to the landscape and forming a source of wealth to the community.

I have spoken of the White Pine (*Pinus strobus*) because I regard it as best adapted to our climate, and to the soil of most of our waste lands. A soil in which the White Oak flourishes will produce grass; and a soil that suits the Chestnut will grow grain; but the White Pine not only grows rapidly on land apparently destitute of all plant food, but actually enriches the soil on which it grows.

I am aware that this tree cannot be successfully grown on lands near the seaboard, and would urge for such localities the planting

of some species known to be suited to the soil and climatic conditions there encountered. The Pitch Pine (*Pinus rigida*) seems to struggle for existence on the sea-coast, and is of slow growth, and produces a wood of little value except for fuel; and he who shall introduce in its place a hardy tree of rapid growth under a like exposure, should be regarded as a public benefactor.

The trees of softer wood, whose fibre is susceptible of being reduced to pulp, and rolled into paper, may prove as valuable to the next generation as the oak has been to the present. Iron has already supplanted oak in marine architecture, and paper may yet take the place of both.

To encourage and promote any new enterprise we have first to show that it is safe and profitable as a business undertaking. We therefore propose to examine this subject of Forest Tree Planting in the light of an investment.

In the case of every experiment that has come within my knowledge the result has proved eminently satisfactory. Although in many instances pines have been planted because the land would produce nothing else, and often for the purpose of gratifying the taste by covering a rocky hill-side or sandy plain, and not with a view to profit, and though they have rarely, if ever, received any culture after planting, in no instance that I have investigated has the outlay failed to prove a paying investment.

Mr. Zebulon Pratt, of Bridgewater, purchased 25 acres of worn-out land in North Middleboro, near the village of Titicut, for which he paid $9 per acre. Having a desire, as he says, to improve the view, and to learn the result from a moderate outlay, but not anticipating a profit, he had it set to white pines, in the spring of 1863, at an expense of $6 per acre, and two years after paid a man $47 to fill up the vacancies where some had died, making the whole cost of setting $200.

The plants were from 6 inches to 18 inches in height, and were set in straight rows 10 feet apart each way. Mr. Pratt wrote me, in December, 1883, in answer to inquiries, "that the trees are now probably from 12 to 16 inches in diameter, and in a thrifty condition," and that he has from time to time been awarded premiums by the Plymouth County Agricultural Society for the best plantation of pines. The lot is taxed for $800, which is based on a two-thirds valuation; and as towns are inclined to favor experiments of this kind, it is fair to presume that the assessors' valuation is not too

high, and that the cash value of the lot is not far from $1,200. Comparing this with the outlay, we have:

Cost of land	$225 00
Setting trees	195 00
Taxes for 20 years	120 00
Aggregating	$540 00

which sum, in 20 years, at 5 per cent compound interest, amounts to $1,431, or $231 more than the estimated value of the plantation. But Mr. Pratt says that he did not embark in this enterprise for a profit, but to benefit the inhabitants of the village, and that he might be remembered pleasantly by those coming after him.

Had he planted this grove with a view to profit solely, he would undoubtedly have set the trees at intervals of 10 feet by 6, instead of 10 feet by 10, thus having 726 to the acre, instead of 425; as it is pretty generally conceded that pines standing at 6 feet by 10 will make a growth of more value than when planted at a greater distance. When planted 10 feet by 10 there is more growth of branches, which are of little value, and less growth of body, than when planted nearer. Now if 425 trees to the acre brings the value of the lot up to $1,200, then 726 trees to the acre would be worth upwards of $2,000, which sum is $272 more than the whole investment would have amounted to at 6 per cent compound interest for 20 years.

After receiving Mr. Pratt's letter I visited the lot, and examined it as well as I could, and was well paid for doing so. The plantation covers a sterile ridge, consisting of sand and gravelly loam, sloping east and west, and evidently well suited to the growth of white pines. So far as my examination extended I could discover no vacancies in the rows caused by trees dying out. But what surprised me most was the number and extent of the lateral branches. Beginning near the ground, each tree seemed to vie with its neighbor in throwing out horizontal branches in every direction. These limbs were from 5 feet to 15 feet in length, and interlocked with each other in all imaginable ways, forming, in many places, an absolutely impenetrable jungle. The conviction was irresistible that, had these trees been properly trimmed from time to time (and the wood so obtained would have paid the ex-

pense), their present value would have been enhanced at least 33 per cent.

Here were said to be 10,775 trees, and, could the whole growth have been thrown into the trunk, they would, I think, have been worth, at a moderate estimate, at least 25 cents each; or a sum total of $2,694, exclusive of the ground they stand on.

Mr. J. D. G. Williams, of Raynham, in answer to some inquiries, says that he set a piece of pine in 1850; the value of the land was $10 per acre, and the cost of setting $5 per acre; and after 25 years' growth the standing wood was sold to a Mr. Thayer, of Taunton, for $150 per acre, leaving the land, as he says, in good order to set again. A very large profit on this investment is apparent without demonstration.

Mr. Williams also set a piece of pine in 1841 on land of the same value, the cost of setting being $6 per acre. This is perhaps one of the earliest experiments of the kind made in Bristol county. These trees, apparently, came to maturity in 1876, as no perceptible growth has been observed since that time. They were set in rows not equidistant but varying from 6 to 9 feet, and from 4 to 6 feet from each other in the rows. A portion of this wood is still standing, and attracts more or less attention. The lot has an eastern exposure, and the trees in the first row on the east side were evidently set for a wind-break, being not more than 4 feet from each other. They are large, with many strong, angular branches, resembling in shape an oak as much as a pine, and containing as much timber, tree for tree, as those less exposed, though not of so good a quality. This lot was examined in 1876 by an experienced lumberman, with the view of buying it, and his estimate of the wood at that time was 75 cords to the acre. About two-thirds of this wood or timber is suitable for box boards, and is worth at the mill, three miles distant, $6 per cord. No arithmetical process is required to show that the outlay here has been a profitable investment.

The late Mr. Richard Sampson, of Middleborough, set a piece of pine on land too poor to cultivate. The growth is now 31 years old, and the wood has been estimated to be worth $150 per acre. But if the worth of an article is what it will bring in market, a much higher figure would better represent its value. This piece, which contains about 10 acres, is remarkably thrifty, and its growth during the next decade will greatly increase its value.

The groves of which we have spoken may well be styled self-made groves, for, excepting the occasional removal of a dead tree, they have received no treatment calculated to hasten their growth or improve the quality of the timber. One noticeable feature in all the groves I have examined is an absence of uniformity in the size of the trees; though all are nearly equal in height, they are of diameters varying from 10 to 20 inches. Occasionally we find a tree of the smaller size, which has struggled for equality from 10 to 20 years, when it was overpowered and its life crushed out by its big and thrifty neighbor; while the larger trees appear to live out all their days, and rarely die, except of old age.

The foregoing instances of rapid growth and satisfactory results are not exceptional cases; they were selected for notice because I was able to get items relating to their history with greater facility, and more in detail, than I could in the case of other groves. Plantations of pines from 5 to 30 years of age may be found in Norton, Mansfield, Taunton, Raynham, Easton, Randolph, Middleborough, and the Bridgewaters; all giving promise of remunerative results.

In investigating this subject I have been somewhat perplexed at the wide range of opinion found to exist in regard to the details of pine culture. One gentleman says they should not stand nearer than 10 feet to each other, and should occasionally be trimmed; while his neighbor asserts that they should be planted very thickly, letting nature do the trimming and the fittest survive. Others say that artificial trimming is often followed by death, and always by oozing of the gum or sap, causing dark spots in the lumber, which the tree will never outgrow; whereas, if the limbs are allowed to fall from natural causes, the wounds that may result quickly heal, and the lumber will be of a better quality. One lumberman asserts that if the tree is trimmed when the sap is dormant no bad or injurious effect will follow; while his partner advised me, in a sort of confidential manner, that if the trimming is done when the sap is in motion, the wounds will quickly heal without injury to the tree. Who shall decide, when doctors disagree? A difference of opinion also exists in regard to the age at which the pine should be cut, to yield the greatest profit. A gentleman of my acquaintance, in whom I place great reliance, having a grove 31 years old, found, by careful experiment, that the growth of the last 10 years equalled that of the first 20.

A point on which all agree is that the young seedling pines

should be carefully sorted before setting, and those uniform in size and vigor should be set together. The propriety of this is obvious, as no one would propose to feed a calf and a two-years old steer in the same manger. I have no practical experience in the cultivation of pines, but, had I a piece of land which I desired to set for a profitable investment, I would plough the land in the fall, and set in the following spring. I would carefully assort the plants, and set those of the same size by themselves, at intervals of 10 feet by 8, thus using 543 seedlings to the acre. I would run a cultivator between the rows about twice a year until the plants had become well rooted, and attained the height of 3 or 4 feet. I would also, with a sharp knife, cut off one or two of the lower lateral branches or shoots, always cutting upward, so that the bark on the under side would not be stripped or torn from the trunk. This I would do annually so long as any branches remained within my reach. By ploughing I should secure to the soil whatever organic matter in the shape of moss or grass there might be on the surface, and by using the cultivator I should destroy or greatly discourage any plant that might undertake to subsist on the scanty food of my pet seedlings, and at the same time increase the absorbent power of the soil, and thus furnish a greater amount of moisture, so essential to the thrift of a young tree in the early stages of its growth. By early and judicious pruning I would throw the growth into the trunk, and gradually accustom its smooth and tender bark to resist the effects of the sun's rays, from which nature evidently designs it shall be shielded by a profusion of lateral branches. This mode of culture would reduce to a minimum the risk of loss by fire. By carefully assorting my trees I would found my colony on a basis of equality, giving seedlings of the same size and vigor equal chances in the race of life, and thus to a great extent avoiding that inequality in size which so much lessens the beauty of the grove.

The treatment above outlined might perhaps be profitably varied by sowing broadcast between the rows the seed of the White Birch (*Betula alba* var. *populifolia*). This should be done when the pines are 4 or 5 years old. Being the only deciduous tree which is known to flourish best where the land is the poorest, they would soon overtake the pines, and by their dense and rapid growth would so check the lateral branches of the pines that pruning would be unnecessary. At the end of 12 or 14 years the birches should be cut, when they would probably yield as many cords per

acre as they were years old. A natural growth of birches would follow their removal, and would mature with the pines.

Eminent medical authority assures us that where pines are grown to any considerable extent the atmosphere becomes saturated with a sort of resinous vapor, peculiarly adapted to soothe and alleviate the sufferings attendant on pulmonary complaints. As nearly all lung diseases are supposed to be the legitimate product of the climatic influences of New England, not only our interests but our duty to humanity should stimulate our efforts to further this industry.

Thus far I have spoken chiefly of the White Pine because it is well adapted to all worn-out, sandy soils away from the sea-shore, is easily propagated, grows rapidly, and at 30 years of age represents more value than any other forest tree in New England. Experiments are not wanting where other forest trees of various kinds have been grown from seed, giving satisfactory results.

One instance is that of Mr. Zachariah Allen, of Providence, R.I., where an old pasture, containing 40 acres, and valued at $15 per acre, was seeded to a variety of forest trees. An accurate account current was kept, showing that the lot, for a period of 57 years, paid 6 $\frac{92}{100}$ per cent per annum on the original investments.

Mr. Joseph S. Fay, of Wood's Holl, Mass., late a member of the Board of Agriculture, has very kindly given me some of his experience in forest tree planting, briefly stated, which I here introduce. He says: "The greater part of a place I bought at Wood's Holl some years ago was made up of hilly pasture land, — worn-out, sandy, gravelly soil, with many bowlders. It was exposed to high winds from Buzzard's Bay, and was of very little value for cultivation. I began by trying some seed of the native Pitch Pine, sowing it broadcast on the surface in the spring. I afterward bought seeds of the Scotch Pine, and some other varieties, and sowed it from time to time, until I had covered about 100 acres. I used some White Pine seed; but this kind is not suitable to the sea-shore, and unless sheltered from the salt water does not thrive. The native Pitch Pines did well for a time, but they seem of late to be taken with a blight, that has destroyed many of them. The Scotch Pines have done very well, and will make good fuel, though I am doubtful as to their value for timber. I suppose my planting for the last 15 years will average 15 feet in height, which is 1 foot a year, and a thick

forest now covers my hundred acres. Being sown broadcast, they have come up too thickly, and I have trimmed out hundreds of loads for fuel, yet those taken out are hardly missed. My neighbors on the Cape plant with a hoe, — that is, cut a place in the sod and drop the seed; others run light furrows, 6 or 7 feet apart, and drop the seed in the furrows at like intervals, and cover lightly, or even not at all, as you may judge by mine being scattered on the short grass or moss. The object in planting by their method is the saving of seed, and, moreover, knowing where the seed was dropped, they can see whether it has failed to come up. Some of the seed may not start or be visible for a year or two. Where you are, I suppose White Pine is a natural growth, and would do well. Seeds of the different pines can be procured at most of the Boston seed-stores. I would recommend the American Red Pine (*Pinus resinosa*); but the seed is very scarce, and not readily found. It is the Norway Pine of New Hampshire, and a very fine and valuable species, the wood somewhat like the Southern Yellow Pine. You will see from what I have written that my work has mainly been in pines grown from seed sown broadcast, involving the least possible labor and expense. I have planted Chestnuts, which have made a very satisfactory growth, and would advise planting them, and Black Walnuts, if you have good soil and rocky land.

"I have planted many thousands of other varieties, covering a large surface, among which are the Scotch or European Larch, Scotch Birch, English Sycamore, Norway Spruce, Willow, and White Ash, all of which have done well. In sowing pine seed broadcast improve the time after a light snow in March or April, so that you can see where the seed falls, that the planting may be uniform and not too thick. If the land is not too poor, Black Walnuts, Butternuts, and especially Chestnuts, planted from the seed, would I am sure prove profitable investments. The seedling Ash, if planted 3 feet by 3 even, would in a few years yield salable hoop-poles, amply paying cost and interest."

The foregoing statement plainly shows what has been done in a quiet way, involving but little labor and expense, by one having the will and energy to do it.

Mr. Frederick Matthews, of Yarmouthport, Mass., states that he has during the last 40 years planted for himself and neighbors about 300 acres of Pitch Pine. This tree is of slow growth; yet some of the older plantations seeded by Mr. Matthews

reached, years ago, a stage in their growth when it was deemed profitable to cut them for fuel; and he is now cutting good-sized wood for his own consumption in a grove only 30 years planted. He has within a few years noticed a blight, which has proved fatal in many cases.[1]

He gathers the cones in October, and, after thorough drying for two months, shells and cleans the seed, and plants in the spring, with a machine of his own construction. He thinks it pays a moderate interest on the investment, and is acquainted with no other tree that is equally adapted to the soil and climate of Cape Cod, or that could take the place of the Pitch Pine.

This tree, as we have remarked, is of slow growth, even under favorable circumstances, and its rate of growth is retarded as you approach the sea-shore, until, face to face with the ocean, it is so slow that even a careful observer can scarcely see any change from year to year. This is a discouraging fact; but he who would dot the sea-coast with groves as yet knows of no species that will root itself in the moving sand, and flourish in defiance of ocean gales, which spend their fury on the coast. Observation and somewhat extended inquiries strongly favor the belief that there is no tree so well adapted to take the place of the Pitch Pine, and to cover the loose, sandy areas of our coast, as the once noted Ailanthus (*Ailanthus glandulosa*). Being aware of the prejudice existing against this tree, inherited chiefly from a former generation, let us examine its merits, and render a verdict in accordance with the facts.

The Ailanthus is a deciduous tree, and, we are told, is abundant in the northern provinces of China, and indigenous to that country. In 1750 it was introduced into Europe as an ornamental tree, and was brought to this country about 1820. From its rapid growth and tropical appearance it soon became a favorite, and was planted extensively in the cities of New York, Philadelphia, Providence, and Newport; and the demand for the young trees far exceeded the supply. As soon as the trees were old enough to produce flowers it was discovered that they emitted a very offensive odor, and the pollen which fell on the roofs of neighboring houses rendered the water collected from those roofs unfit for drinking or culinary purposes. On discovering these objectionable characteristics, those who had been cherishing this rare exotic

[1] This blight and that noticed by Mr. Fay are doubtless caused by the Pine Moth of Nantucket (*Retinia frustrana*).

were suddenly seized with disgust, and war was declared against the offending Ailanthus, resulting in its almost complete extermination. A few trees may still be found, scattered over the Island of Rhode Island, and in some of the villages of New England, — lineal descendants of a despised and persecuted generation.

The objection to the Ailanthus which operated so swiftly to its discredit disappears quite as quickly when it is regarded in the light of a forest tree. The wood possesses many valuable qualities. Its specific gravity is said to be but little less than that of the Oak, and more than that of the Black Walnut. It is of a pale cream color, admits of high polish, seasons readily without checking, and is a strong, durable wood when kept from the weather. Professor Sargent, to whom I am indebted for much valuable information relating to the Ailanthus, says, in his "Notes on Trees and Tree Planting,"[1] "There are thousands of acres of shifting sand and barren soil along our sea-coast, southward, too poor and too exposed to produce, naturally, anything but a scanty crop of beach grass, on which the Ailanthus would thrive, and which, thus covered, would add enormously to the natural products of the country. Such plantations would amply and speedily repay the original cost, both in direct income and by the protection it would afford to more valuable land. Valuable timber, for purposes of construction, might not grow on soil so poor and exposed, but immense quantities of fuel, easily accessible to market, would be produced from land now worse than useless to its owners. On almost every inland farm there is some old, neglected gravel-pit, or bank, or knoll, too stony and poor for cultivation, which might be profitably planted with the Ailanthus; and these plantations would provide in a dozen years, more or less, a large amount of valuable fuel, and might be cut, and cut over again indefinitely, as there seems to be no limit to the power of this tree to throw up suckers from the roots. Or, if permitted to grow from 20 to 40 years, such plantations, costing but little to make, and occupying land good for no purpose but to pay taxes on, would produce a material valuable for industrial purposes, for which a ready sale at good prices could always be obtained."

Mr. George P. Marsh, in remarking upon the efforts of the Russian government to cover with forest growth the northern coast of the Black Sea, where the loose, sandy soil, to the depth

[1] Read before the Massachusetts Board of Agriculture in 1877.

of a foot, is liable to be moved with every changing wind, says: "The tree best suited to this locality — and, there is good reason to suppose, to sandy plains in general — is the *Ailanthus glandulosa.*' With testimonials like these it is certainly safe to give the tree a fair trial. There is no soil so poor, and no situation so exposed, that it will not grow there. It is propagated as easily as the blackberry. A piece of the root the size of your finger when planted will produce a tree, and the seed, whether scattered on the surface, or covered with soil, will quickly germinate. One objection to the Ailanthus as an ornamental tree was its tendency to throw up suckers from its roots, and thus reproduce itself without limit, — a positive virtue when cultivated as a forest tree. Unlike the oaks and pines, it increases in size most rapidly during its earliest years. The perfect adaptation of the Ailanthus to the localities mentioned may be justly regarded in the study of the origin of varieties as an evidence of design.

In view of the foregoing facts, however imperfectly presented here, it is not easy to account for the general apathy found to exist on this important subject. Capitalists are eagerly seeking permanent investments promising not more than three or four per cent per annum, while the industry we advocate pays a better dividend, and in every instance has proved financially successful. One of the motives which prompted Mr. Pratt to plant his grove, he says, was, "that he might be remembered pleasantly by those coming after him." To this must be added the genuine satisfaction of having contributed to increase the wealth of the country, at the same time clothing the sterile hill-side with verdure. This is, in itself, a dividend, which, though not contributing directly to swell the cultivator's bank account, nevertheless possesses a value not easily overrated.

Discussion.

William C. Strong was called on, and said that it was a very great surprise to him that the people of Massachusetts do not cover their barren hill-sides with trees. He knew a sand-bank in which there was apparently not a particle of organic matter, where a gentleman, living opposite, planted white pines, which are now growing thriftily, and present a much pleasanter appearance than the naked sand.

At the meeting two weeks ago we were told that the early settlers of New England complained of drought, and the con-

clusion was drawn that they suffered as much as we do from that cause, and that the climate has not been affected by cutting off the primeval forest.

The first settlers did not cultivate as deeply as is done now, and so had not the protection from drought which deep cultivation affords; and it does not follow that the climate has not been modified. The rainfall and thermometer might not show much change, but the speaker thought the more delicate test of the hygrometer would. Streams flow more rapidly and are of briefer duration than formerly. In Maine lichens flourish on trees more generally than they do here, showing a moister atmosphere; here they are found only in swampy locations. Mr. Strong hoped that the lecture would be of practical benefit. On some farms it would be better to devote half the ground to trees and spend more time on the other half than to attempt to cultivate the whole.

Joseph Clark said, in answer to an inquiry how much shelter is necessary for white pines on the sea-coast, that it is more difficult to cultivate them on the side of a hill next the sea than on the sheltered side; but he thought they could be established, especially when planted thickly. The Austrian Pine is the best for planting on the sea-coast, though the Scotch Pine is hardy there. The White Pine will flourish six hundred feet from the ocean.

Edmund Hersey thought that the paper read covered the ground very well, but there was one tree not mentioned — the Red Cedar, — which, in his judgment, might take the place of the Pitch Pine on the sea-coast. It will grow on the poorest land, where grass will not grow, and will stand the ocean spray and even the wind on the ocean bluffs. He did not believe the Pitch Pine ought to be encouraged, and would cut it down as soon as he could find anything to take its place. It will cover poor land, but the Red Cedar will do so nearly as soon. The *Salix purpurea* (Purple Willow) will grow on high, sandy land, and in four years will make excellent hoop-poles; and the speaker thought it would be more profitable than pine. He did not approve the recommendation of the essayist to plant white birches among white pines, but would plant the pines thickly enough to shelter each other. The birches would crowd out the pines.

Mr. Hersey did not think we are suffering greatly from cutting off forests, but did think we ought to attend to tree planting. We do not train our forests so that they will be most profitable; we

do not leave the good seedling trees and thin out the poorest ones, as we should do. If our fathers had done this we should have better trees than we have now, and we should do it for the sake of coming generations.

John Robinson said that in planting trees we should not overlook those most in demand for timber, such as the Butternut, White Oak, Chestnut, and White Pine. The wood of the Red Pine (*Pinus resinosa*) resembles that of the White Pine so closely that it is difficult to tell them apart. This tree is most desirable for its beauty; it resembles the Austrian Pine, but is preferable as being a native species. Foreign species which are worthless here frequently have valuable native counterparts. By taking cuttings of the Ailanthus from female trees we can avoid the objectionable odor. There are many trees which will thrive south of Cape Cod which will not succeed north of that peninsula, as we know the Cape Cod plants flourish in Long Island and New Jersey and along the Southern coast. He had seen the *Salix purpurea* growing wild at Beverly within a stone's throw of the ocean, and the *Salix alba* at the exposed "Salem Neck," as healthy as in the interior. In the white pine woods along the Beverly shore there are trees two feet in diameter, where they have the protection of other trees, and but a few hundred feet inland they thrive without such protection.

Professor Robinson did not agree with those who thought that pruning forest trees is going to injure them, but it must be done properly, as in Europe, where forestry is a science. There a man goes round with a billhook, and cuts the limbs off close, and covers the wound with coal tar. The best time to do this is in winter, when the trees are dormant, as the growth is not checked then, and as soon as the tree begins to grow the wound will begin to be covered. If the pruning is left to nature there will be innumerable pins several inches long, each of which will make a knot in several boards when the trunk is sawed up, but if cut close only one or two boards will be affected.

It is evident from the Census Report on Forest Trees that our Western forests are being destroyed with fearful rapidity, and that ten or twenty years hence Chicago will not be the great lumber market it is now. The same reckless destruction is going on at the South, and along the Pacific coast, though we may be improving in New England. Just such meetings and discussions as this are necessary to awaken the people to the need of tree planting

and protection, and make them understand that we must have laws for the protection of forests.

J. W. Manning said that the Red Cedar is an excellent tree for bleak places, and is easily transplanted. He had set out ten thousand, of which not one in ten died. He thought the lumber supply is improving in the White Mountains. Fires destroy more wood than cutters, and are fed by the waste, rotten trees left by the lumbermen; but there are no Norway Pines among these, for they do not decay at the heart.

Fire is one of the most difficult things to deal with; one lumber man estimated that it does a hundred times as much damage as the axe. Sometimes the soil is composed of spongy vegetable matter to the depth of two or three feet; the trees root all through it and if it is burnt off trees will never flourish there again. He had seen white pines five feet in diameter where the soil below looked like ashes.

Asa Clement said he had been much interested in Mr. Slade's paper, and concurred in almost everything he had said. He spoke with regret of the noble White Oaks once common in our forests, but now exhausted, having been used for ship-timber. They were dug up to get knees for ship-building; the carpenters would bring patterns to get such as were wanted. He has White Oaks and Hickories which he has been nursing for forty or fifty years. Some manufacturers have to send hundreds of miles to get such timber as they want. In cutting firewood for the Lowell market his practice is to cut clean, and leave the stumps to sprout, as hardwood trees will do if not too old. He hoped that such discussions as this would arouse men to care for the timber they have, and to provide for the future, and not destroy trees for the sake of destruction.

Mr. Strong could not agree with the recommendation of some, to prune in summer. It is true that the wound will be covered sooner, but the shock to the tree from taking off large limbs is much greater than when the tree is dormant.

William H. Hunt said that the question before the meeting is a very important one. There is a difference between the situation here and that at the West. Taking the country as a whole the forests are disappearing, but here they are increasing. In New England there is much land not profitable for cultivation, on which much labor has been expended that has been substantially thrown away, — land so stony that no one ought to have attempted to

cultivate it. Many acres of such land are now growing up to wood, and if left to nature will inevitably gradually work into forest. He has a farm which contains a pasture of about fifty acres, where such a change is going on, and he assists it as far as possible. The best thing that owners of rough pastures can do with them is to leave them to grow up into forest, and help the process a little. A little care to exclude cattle will be well repaid, for the food they get from them is not valuable, and if the injury to the forest is reckoned, the food obtained will not balance it. The White Pine is the best tree for such pastures as have been mentioned: the lumber is always in demand. The trees which have grown up in this way have been mostly cut off at an early age, and little has been left to grow into large timber. The speaker had a black walnut tree two feet in diameter, which he cut down, and which made considerable lumber for the inside finish of his house. He had found the black walnut difficult to transplant; he had tried trees two or three feet high, and they had lived, but had not made a rapid growth, — not as much as he expected.

Mr. Hunt agreed with Mr. Strong that the climate has changed here as a result of cutting off the forests. The culture of the early settlers was not as deep or as complete as ours is now. He thought that the planting of trees in the West would bring about a change in the climate there.

Mr. Hersey's experience had been that black walnut trees are not difficult to transplant.

Mr. Strong thought that generally it would be better to procure seedlings of forest trees than to sow seed. The seedlings can be bought very cheap of nursery-men. Young White Pines can be picked up in the woods without cost.

J. W. Manning said that the Red Pine is very abundant in some localities. It is adapted to peculiar soils, where rye will not grow. At Fryeburg, Me., there is a forest of these trees 80 feet high. There is a Black Walnut in Saugus almost 5 feet in diameter, and one in Billerica 12 feet in circumference. The black walnut is easy to transplant.

Col. Henry W. Wilson thought we could easily satisfy ourselves that raising forests is a good thing; but there is little inducement to do it here, for it offers a temptation to every loafer to go through the young plantations with a gun and dog, spreading destruction by fire. Col. Wilson alluded to the associations connected with trees, and the love entertained for them; they are a source of satis-

faction to the planter and his children. It is good to encourage the planting and growth of nut-bearing trees; the right to their fruit can be enforced. Many of them, like the Hickory and Chestnut, are difficult to transplant, having long tap-roots; which are a source of vigor of growth; and the best way to raise them is to put a nut into the ground wherever a tree is wanted. The black walnut tree will grow here, and makes the most valuable lumber, good boards being worth $125 per 1,000 feet; but it is a tree to grow for 100 years hence; it requires 50 years to grow, and 50 more to solidify and mature. A tree 50 years old has not half the value of one 100 years old.

The speaker called at a place in Hampden county, which afforded an illustration of what a farmer can do by caring for a wood-lot. In a 40-acre lot on this farm the thinnings last year comprised 500 chestnut railroad ties, which sold at from 50 to 60 cents each. Basswood, in some places, brings $8 per cord, for paper stock. We must study the growth of trees, and the soils and markets, and adapt them to each other. There is an exigency for applying a system of forest planting to whole districts in New England. In the best farming districts there are abandoned farms, within 65 miles of Boston, where not a spear of grass grows that is of any use to man, and the only thing to be done is to let them grow up to wood.

Hon. Marshall P. Wilder, who had just come in, was called on, and said that he had heard only Col. Wilson's remarks, which he fully approved. We have a great quantity of land in New England which can be made productive only by planting with trees. There are still immense quantities of timber in Alaska, Oregon, and Mexico, which will afford supplies for a long time to come. The necessity for planting forests in New England has been overlooked, but a spirit is now abroad which is arousing the people to its importance, and he thought we should not realize the fears which have been entertained of the exhaustion of the supply of lumber, and of other evils arising from the destruction of our forests.

It was announced that on the next Saturday Edward L. Beard would read a paper on "Herbaceous Plants *vs.* Bedding Plants."

BUSINESS MEETING.

SATURDAY, January 24, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

Hon. Marshall P. Wilder announced the decease of the eminent pomologist, Charles Downing, of Newburg, N.Y., a Corresponding Member of the Society, whose life had been most useful, and whose death was a great loss to the country; and moved that a committee be appointed to prepare memorial resolutions. The motion was carried, and the Chair appointed as that Committee Mr. Wilder, William C. Strong, and Robert Manning.

Adjourned to Saturday, January 31.

[Here follows, at Vol. 5, page 268, of the Society's Records, under date of January 28, 1885, the record, directed by vote of the Society on the 4th of October, 1884, to be made, of the enclosing of the Society's land on Bromfield and Bosworth streets, but it is not deemed necessary to print it. It is also recorded with Suffolk Deeds, lib. 1664, fol. 146.]

MEETING FOR DISCUSSION.

HERBACEOUS PLANTS *vs.* BEDDING PLANTS.

By EDWARD L. BEARD, Cambridge.

Probably most of those gathered here are quite familiar with Hardy Plants and their attractive features; but a keen faculty of observation on the part of the horticulturist is not requisite for detecting the fact that in every quarter, — in the small garden, as well as in the gardens of the more favored, what are popularly known as bedding plants have so far usurped the place of their less obtrusive relatives, hardy herbaceous plants, that the latter are, to a large extent, unappreciated, because forgotten and unknown. These remarks apply not only to hardy plants but to some beautiful things not altogether hardy, but such as the gardener whose love for his profession rises above the mere drudgery often incident to its pursuit may, with the aid of cold frames and covering, protect through our trying winters with comparative ease;

being more than recompensed in spring and summer by the unique beauty of blossom with which some of the more tender species are favored.

I have set the two classes of plants — the hardy and the more tender bedding plants — against each other for our consideration and comparison. The latter includes the Geranium, Coleus, Alternanthera, Pyrethrum, Lobelia, and others, and depends for effects upon color and strong, often glaring, contrasts. That is to say, most bedding effects have these characteristics. Some combinations of bedding plants, in certain gardens, have these faults less obtrusively displayed, and often a harmony in the blending of colors is apparent, forming a pleasing picture in a wide frame of green, where distance and also perspective tend to soften, and at the same time to enhance, the effect of the contrasts. These effects, produced with bedding plants in combination with large and small succulents, aided here and there with the hardier palms and bromeliads as adjuncts to the whole, are noteworthy and commendable, bringing into play the utmost fancy, skill, and taste of the gardener; who each year seeks for new combinations of color and form. Such displays show favorably in certain locations, where they are but one feature among many others and do not wholly absorb the gardener's interest and attention.

But in this country, where gardening as an art is still something of a weakling, these pleasing horticultural pictures must necessarily be confined to the gardens of a few wealthy persons, who are fortunate enough to command the services of able gardeners whose taste is marked and preëminent. I would not have it inferred that all men of wealth are so favored, for in many instances I have known the master and the man, while intending to beautify an estate, to be joint partners in making it hideous and a complete exposition of bad taste and vulgarity, when in other hands it would have been made strikingly beautiful.

Bedding out, as generally practised by the amateur and gardener, is like the first attempts of a tyro in painting, — very crude and inharmonious. Ignorance of the character and value of plants, in their relation to the picture or mosaic to be formed, is, perhaps, the chief difficulty in these instances. In many, and, I may say, in most, places where a gardener is intrusted with power to fill up and arrange the beds for the season, will be found a yearly recurrence of the monotonous, never-blooming reds and yellows, with a few inconspicuous and dingy intermediate colors, which, in our

summer droughts, or in heavy rains, assume a forlorn aspect, upon which the curtain is abruptly dropped by a sharp frost early in the season; after which, the gardener, though no doubt weary of the monotony, sets himself to work to propagate plants and otherwise prepare for the next summer's three months' panorama of color. This preparation, considering the work involved, is one of the strongest arguments against the bedding-out plan of gardening as practised in places where the ordinary greenhouse is maintained. Most greenhouses are expected to furnish a supply of flowers in winter; but it is evident that in many of them the bedding plants come in for more than their rightful share of space, crowding out flowering plants and overtaxing the gardener, who is made responsible for a regular supply of cut flowers from the time that frost sets in until the garden can be again drawn upon. I have heard complaints made of short floral supplies in winter, on various occasions, and in quarters where this onerous system of bedding out, and not the gardener, was justly to be held accountable. The latter will therefore find it for his own interest to aid in revolutionizing methods and tastes which are the outcome of indifference or ignorance. A more general insight into the beauty and adaptability of hardy plants and bulbs, and a more practical study of their habits and requirements, on the part of the gardening craft at large, would ultimately lead up to such an exposition of beauty in our garden borders that the wearisome round of bedding out and the monotonous recurrence of its short-lived display would become, not obsolete, perhaps, nor would I have it wholly so, but, at least, subordinate to the more refined and satisfying culture of hardy plants. Robinson, in "The English Flower Garden," part 1, p. xxxii, says: "The sacrifice of flower gardens to plants that perish every year has left them so poor of all the nobler plants, — has, in fact, caused the expenses of the garden to go to purposes which leave it at the end of every flowering season almost generally devoid of life. We here take into account the hot-houses, the propagation of plants by thousands at certain seasons, the planting out at the busiest and fairest time of the year — in May or June; the no less necessary digging up and storing in autumn, the care in hot and cool structures in the winter, the hardening off, etc. Now expenditure should go towards permanent arrangement and planting, and that for the best possible reason, — that very often the best things of our gardens . . . did not really cost at first a sum that any cottager would grudge."

In our brief summers the display made by bedding plants falls short of three months in duration. It requires at least a month for plants taken from propagating houses or cold frames to establish themselves when transferred to the open ground, and even more than this time elapses before they have grown into form, and developed color of leaf or blossom, sufficiently to make effective contrast or display; and, as already intimated, the first sharp frost relentlessly cuts off leaf and blossom when at their very best. The friends of bedding out claim for their hobby a lasting beauty through the season; but is not lack of that its prominent defect? Month after month, and year after year, we have the same stereotyped style of display, until the eye tires of it and interest flags. What is needed in its place is diversity of form, and artistic combinations, which may attract the attention and gratify the taste. Let us mark each season with its flowers and enjoy them in their order, and our interest and pleasure will become more marked and satisfying with each successive year. Our attention will be directed to new resources, hitherto unappreciated or unknown; for in the realm of horticulture there appears no limit to fruitful investigation and experiment.

A well-known writer, summing up the contrast between hardy and bedding plants, says, "There is nothing whatever used in bedding out to be compared in any way — in color, scent, size, or bloom — to specimens belonging to many families of hardy plants now obtainable. There is no beauty found among bedding plants that is anywise comparable with that of Lilies, Irises, Pæonies, Delphiniums, Narcissuses, and a host of others. Are we to put aside all this glorious beauty, or remand it to a second place, for the sake of the comparatively small array of plants that afford merely beds and belts of color? Let those who like bedding plants enjoy them; but no one who knows what the plants of the northern and temperate regions are can admit that their place is a secondary one."

I might pursue this subject further, and reason from an æsthetic stand-point against the artificiality of bedding out, and its violation of artistic principles, independently of its practical disadvantages; but as we have to deal with practice rather than theory, it is better that I attempt to show how many beautiful, and to most people unfamiliar, plants can be used to decorate our gardens and grounds; of which the great majority are barren wastes, compared to what a little knowledge and taste might make them.

Indifference and ignorance, in relation to the higher details of gardening, are so general that it will not be possible to revolutionize them in a day; nor shall we see a decided increase in horticultural taste and refinement until lapse of time, and further growth in civilization, shall have afforded those opportunities of research and experience which are needed to teach all the beautiful possibilities of floriculture, and shall have demonstrated to us that among the fruits and flowers may be found delights, which, once tasted, will never be willingly forgotten or relinquished.

But a hopeful augury for the future appears in the rapid and unprecedented increase of popular interest not merely in the outward forms and varieties of plants, but in their culture, development, and improvement as well. Within ten years amateur and professional horticulturists have originated many striking novelties and improvements in popular flowers, and we already see our seedling roses, chrysanthemums, and carnations sent abroad to grace the pages of foreign catalogues. All this marks decided progress; mostly, it must be confessed, confined to the professional grower, but with such a start we have every reason to hope that in this great country, with its varied climates, we shall yet develop a circle of skilled amateurs, who, while they may not outrival such men as Ewbank, Maw, Horner, Ellacombe, Wilson, and many other noted Englishmen of the same class, may at least achieve sufficient success to have their names, and the results of their labors, similarly esteemed. The present list of American amateurs, who devote their attention with any marked results to the improvement and development of the floral world, is a very small one; and it will remain so until we find our gardens filled with a more varied selection of plants, and until a greater general knowledge concerning them shall have been diffused, through the influence of such organizations as this Society.

When I undertake to advocate, against the popular and well-known system of bedding, a resort to the great family of comparatively unknown hardy plants, and bespeak for them consideration and cultivation, it is not with the hope or expectation of any immediate general revolution in practice, but rather of inducing some few to give up their beds of scarlet Geraniums and gaudy Coleus, and find new pleasures among the Lilies, Narcissuses, Irises, and the thousand and one other beautiful members of the hardy family.

My remarks are directed more especially to the possessors of small gardens, — those little plots of ground scattered in all

directions about us,—the majority of which at present have no attraction in summer but a few starved and ill-appearing plants, brought from the florist, and left to themselves and the family cat; and permitted, like the latter, to run wild at their own convenience. Under these conditions it is no wonder that many people who can afford to have a garden, and who tell you they enjoy flowers, attain no real success, and gradually lose interest in their flower beds, until weeds and grass blot out even their first attempts at gardening.

To be a successful horticulturist one must have a competent knowledge of his subject; and this, like all things where success is desired, requires effort and study. Such knowledge once gained opens the way to easy methods, and the discouragements which attend the first developments of horticultural taste give way to the certain consummation of all that is undertaken. Knowledge brings new delights in the garden, and what once seemed impossible to achieve, becomes not a task but a pleasure of absorbing interest. Drudgery ceases to be drudgery because of a certainty of accomplishing all that is undertaken. I think all will agree that this is the secret of success, and that those who are willing to learn through patient study the habits and requirements of everything which takes root, grows, and blossoms, have no reason to doubt the result.

My suggestions so far have been more in the abstract than in the concrete; and I will now turn from any arguments for or against the favorites of different cultivators, and consider how our gardens may be made beautiful by the culture of hardy plants.

It is useless to hope for success without, at the outset, making reasonable preparation for the growth of these plants. Most of them are deeper rooting than bedding plants, and therefore the beds for their reception must be trenched or spaded to a depth of two feet, and well manured. Most herbaceous plants are good feeders, and require good soil. Beds must not be located under trees, where the roots of the latter can impoverish the soil. Many of the failures in the cultivation of these plants are due to neglect and consequent starvation, and the grower, discouraged by his indifferent success, pronounces them worthless, when, on the contrary, had he given them due attention at the proper time, they would have proved themselves worthy of all the care bestowed on them.

Robinson says, in this connection, the idea that, once these

hardy plants are planted, they will go on satisfactorily for many years without any further cultivation is one of the greatest delusions possible; for, unless the soil in which they grow is kept in good order, the vigor of display and of bloom ceases to be what it should, and the whole thing is a failure; still it must not be inferred that they require the attention of yearly transplanting. An annual top-dressing of well-rotted manure, or leaf mould, is a great aid to most hardy plants, but they dislike the spade, and ought not be dug about, except when lifted or divided. It is well to let the leaves which fall upon herbaceous beds remain there during the winter, this natural covering and nutrition proving beneficial.

A large proportion of this family is greatly benefited by being lifted every few years, and divided and transplanted. Pyrethrums, Phloxes, Delphiniums, Narcissuses, and the rest, all feel the good effect of transplanting and division at intervals of two or three years. Many make rapid growth and form large clumps in the ground, and these can be lifted and divided in early spring, before active growth begins, and successfully transplanted. This facility is a benefit to the grower, who can increase his stock without cost, and contrasts favorably with the constant labor and expense requisite to keep up the stock of bedding plants, the propagation of which, even where the facilities exist, is, as I have shown, a serious tax upon time and space.

One of the favorite arguments used against the cultivation of hardy plants is that they do not give continuous bloom through the summer, and that the beds containing them are not as showy as those which afford a mass of color, like those filled with geraniums or petunias. This is very true where no provision is made for a succession of bloom by selecting such varieties as come into bloom at different periods in the year. The intelligent grower, however, does not make this mistake; and here it may be said that the greatest loss under the bedding-out system is that of the blossoming in spring and early summer of Tulips, Scillas, Grape Hyacinths, Narcissuses, hardy Primroses, Saxifrages, Irises, Fritillarias, Globe Flowers, Crocuses, and hosts of other choice plants and bulbs, rarely seen under general cultivation.

Our list of spring-blooming hardy plants and bulbs would be greatly extended could we include the varieties which are hardy in England, but whose endurance through our trying winters is uncertain. Cold frames, therefore, should be utilized for this class,

and a more general use of these conveniences should be favored. In them, Violets, Anemones of all the early-blooming kinds, Forget-me-nots, Primroses, Hellebores, Hepaticas, Pansies, and many other beautiful things can be grown to greater perfection than in a greenhouse. It only needs that the possibilities of frame culture should become fully known and understood to insure to the amateur who lacks a greenhouse the greatest success with the class of plants I have named. With frames open to the sunlight, and protected by the usual methods, one may have flowers in plenty from January till June. The Pansy, which is everybody's favorite, is rarely seen in perfection except in a cold frame.

The arrangement of hardy flowers in the garden affords so much scope for taste and knowledge, that it would require a volume to make plain the numerous and various phases of grouping that may be devised with an eye to effect and continuity of bloom. The landscape gardener, in laying out lawns, etc., endeavors to form groups of trees and shrubs of contrasting habit of foliage, through which pleasing vistas for the eye may be open. Only the inexperienced will proceed to dot in here and there an individual tree or shrub, which, by its isolation, loses its effect. We must carry this idea into the flower garden, in our arrangement of hardy plants, so far as it relates to the grouping of a number of one species or variety by itself. A hundred Daffodils growing gregariously is a much finer sight in bloom than if the same number were scattered or dotted over the surface of a bed, and by carrying out this idea with all the dwarfer plants, much better results are attained; and we can extend it, if space permits, in combinations of hardy flowering shrubs, the use of which I favor most decidedly in forming our beds of hardy flowers.

We have few dwarf shrubs like the Hollies and Yews of England, which, with their shining foliage, are such additions to flowering beds there, but in place of the latter we can use, for the backs of such beds as rest against a wall or fence, and for the centres of beds which stand upon the lawn, the dwarfer hardy Rhododendrons, the Kalmia, Barberry, *Spiræa Thunbergii*, *Hydrangea paniculata*, and here and there some of the stronger growing roses, which seem to have been supplanted nowadays by the more delicate and tender exhibition sorts. The latter, for general display, cannot be compared with varieties like Mad. Plantier, Harrison's Yellow, and many of the climbing roses, like Baltimore Belle which, though a climber, is a most beautiful sight when left to

scramble over a slight support in a bed or border. The Japanese *Rosa rugosa* and the white variety are two of the finest plants that I know of for use in such a bed as I contemplate. Both have dark, shining, and persistent foliage, which is not subject to insects, and the blossoms and hips, especially of the red variety, must be seen to be appreciated. I may also include hardy Azaleas, the Japan Quince, Viburnums, Weigelas, Andromedas, etc.; but I hardly need to give an extended list of those appropriate for the purpose I have named, as they are perhaps better known than the herbaceous plants. No bed, however, can be made quite effective without them, and they take on new beauty when combined as I have suggested. I refer to them as valuable additions necessary to the effect in planting. In small beds, a specimen of this class here and there breaks the level and relieves the eye as to general effect, besides affording bloom, and in larger beds the dwarfer kinds, two or three of each, may be planted together, at intervals. There should be no crowding, but ample room should be left between them for colonies of hardy and dwarfer plants.

In conjunction with the shrubs may be planted the taller and more robust members of the hardy family, but so that they shall not be unfavorably dwarfed and overgrown by the former. Among these are the broad-leaved Funkias, or Plantain Lily, the best varieties of which are *ovata*, *Sieboldiana*, *grandiflora*, and *subcordata*, all of which are bold and graceful, lending a tropical effect, and they are quite hardy and vigorous. The Hemerocallis, or Day Lily, is another graceful and strong-growing plant which looks well grouped with shrubs. Among the best species are *Thunbergii*, *Kwanso plena*, *disticha plena*, and *flava*. To these may be added the Delphiniums, which are taller growing, and may be planted, in groups or isolated, among the shrubs. By this I do not mean under the shrubs, but at distances affording room for growth and development, without either wasting room or overcrowding. There are so many beautiful varieties of these that no collection is complete without them. Some of the newer kinds throw up spikes of bloom nearly three feet in height, and as regular in form as those of hyacinths. The Delphinium, by cutting down some of the flower spikes, can be kept in bloom up to frost. Another valuable plant to combine with these is *Galtonia candicans*, formerly known as Hyacinthus. This has proved to be quite hardy; and, while isolated specimens are not so noticeable, a

group of them, with their bold spikes of white wax-like flowers, is a sight which commands attention.

In such beds nothing is finer among the taller plants than the Clematis, trained loosely to a light support, or, what is better, left to climb over the taller roses, with the blooms of which it affords a fine contrast. Among these *Jackmanni*, *Fortunei*, *Flammula*, and some of the hardier of the hybrids are best. *Clematis coccinea*, especially, looks best grown in an open bed, and left to itself to find support on neighboring plants. It has a scrambling habit, but it is a beautiful object when in perfection. Another plant seldom seen, and yet worthy of a place in every garden, is *Lathyrus latifolius*, the Everlasting Pea. There are three varieties of this, which I have seen, — *grandiflorus*, a bright scarlet; *albiflorus*, the white; and a striped variety. This splendid perennial loves to be undisturbed, clambering over any support near it, and flowers incessantly, especially if not allowed to form seed. Its flowers are especially adapted for cutting, and last long after being cut.

Among the herbaceous plants none are more striking than the Campanulas, and no bed ought to be without them in variety. There are many dwarf and Alpine species, which are particular as to location, and need especial care, but among those which are robust enough to flourish in the border are *Carpatica*, *persicifolia*, and the double variety of this, both white and blue, and Van Houttei. *C. glomerata Dahurica* is one of the finest, but I do not know whether or not it is hardy here. These are dwarfer plants, all good for cutting, and I would favor their being planted in groups of two or more. As companions to these, and among the finest of all hardy plants, are the double and single Pyrethrums. When once established, they form strong clumps, and are profuse in bloom. The double kinds most of us have seen on exhibition here, but they are generally unknown except among amateurs, who are familiar with their merits. I know of no choicer flower for cultivation in the garden, where cut flowers are wanted. They are as desirable as the Chrysanthemum, and there is a delicate refinement about the flowers, as well as diversity in color, which ranges from pure white to brilliant shades of scarlet. They are quite hardy, but like good food and occasional division. The single ones I do not so much fancy, though good colored varieties are very striking. With a stock of these in the garden, few would wish to exchange them for bedding plants.

Among other good things are the white and red *Dictamnus Frax-*

inella. Both this and the Campanulas and Pyrethrums grow to about the same height, and can be grouped harmoniously. Among the taller growing perennials for centres of beds, Phloxes form attractive masses of color, and the later hybrids are so bright and vivid that a group of them here and there holds the eye, while their habit is favorable for use in small beds. They are more attractive when used in combination with other plants than as isolated specimens.

Then we have the Lilies, a family altogether too little known and understood. They can be planted among the Rhododendrons and taller shrubs, where their heads of bloom will shoot up in their respective seasons with an appropriate background of green, that adds very much to the effect. The protection thus afforded them is valuable, and in a well-made bed the majority of the more robust are certain to thrive. All lilies look better in groups than as single specimens. The old Tiger lily affords one of the most charming bits of color when left to multiply and bloom in masses in conjunction with other plants. *Lilium candidum*, *Martagon*, *umbellatum*, *longiflorum*, the varieties of *speciosum* like Melpomene, *præcox*, *rubrum*, and others, are among the best. *Lilium auratum* is one of the finest species, but cannot be depended upon to thrive for any length of time in most locations.

The Tritomas, with their flame-like flowers, are fine autumn-blooming plants, and when a mass of them comes into bloom in September they light up the garden with their orange and yellow spikes, which resemble, in their gradation of color, a red-hot bar of iron. They are hardy in England, but not so here, and have to be lifted, and stored in a cool place secure from frost. They require so little trouble, however, that any garden of hardy plants ought to include them, especially as they bloom in connection with the Japanese Anemones, of which the white variety known as Honorine Jobert, especially forms a splendid contrast with the Tritomas. What can be finer as a garden plant than this, with its masses of pure white flowers, larger than a silver dollar, with yellow stamens? And yet it is not generally seen, though it has been introduced for some time. Both this and the rose colored variety are hardy, and should be planted in quantity. They blossom until the frost cuts them down, and are among the latest out-door flowers we have.

The Irises can be used to great advantage in mixed beds, and their magnificent flowers, often comparing favorably with the

Orchids, command general admiration. With a few exceptions, they are strong growers, and multiply rapidly, most of them blooming in early spring and summer. The varieties are numerous, but *Persica*, *reticulata*, and the English, Spanish, and German species are among the best for general use. The last-named species is robust, every shade of color will be found among its varieties, and they are unparalleled in beauty. Hybridization has produced a large number of greatly improved varieties, which can be purchased at reasonable cost and made most effective in the garden. The Japan *Iris Kœmpferi* is even more gorgeous than any of its fellows, and if it could be relied upon in the border, it would not have a peer in the family to which it belongs. Our dry summers, however, are unfavorable to it, as it likes a moist situation, partially shaded. We have seen how Mr. Parkman has produced new seedlings of this, which rival any of European origin, and, with plenty of water in summer, and protection from too much stagnant moisture in winter, we ought to make it thrive as he has done. It is worth the effort to establish it in mixed beds. I have known some varieties to produce flowers ten inches across. There are many other gorgeous species and varieties, but these will suffice for general use.

No collection of hardy plants would be complete without the Pæonies. They are stately and noble in growth, with fine colors, and the huge flowers of many of the varieties are fragrant. Both the single and double forms of the Tree pæony (*Pœonia Moutan*), are fine, and they are the first to bloom but they are of tall growth, and for the mixed bed are not as useful as the herbaceous kinds, hybrids of *P. officinalis*, crossed with such varieties as *albiflora*, *Sinensis*, and *edulis*. From these have sprung magnificent forms embracing unequalled colors. An extended list of named varieties is given by English and Continental growers, and by some of our own nurserymen. Some are inclined to speak contemptuously of the Pæony, associating it with antiquated garden flowers; but a knowledge of the great improvement effected by hybridization will suffice to change this into admiration. *Pœonia tenuifolia flore pleno* is a dwarfer kind, but one of the most striking, resembling a large rose of vivid color.

Another good thing, not well known, and a striking object in the garden, is the Double Sunflower (*Helianthus multiflorus flore pleno*). This must not be confounded with the tall sunflower. On the contrary, it is dwarf and compact, bearing vivid yellow flowers,

quite double, and about the size of a Dahlia. It is not so formal as the tall kind, and is very useful for cutting.

The Poppies embrace some varieties worthy of culture everywhere. Those of us who have seen a mass of *Papaver orientale* know what a brilliant thing it is, with its immense, fiery-scarlet flowers, six inches across, marked with great blotches of black. This, with some of its varieties, such as *bracteatum* and *concolor*, should be used as positive colors in arranging our beds of hardy flowers for effect, and there are few things that could take their place.

The Aquilegias, or Columbines, we cannot ignore. Some of them bear most exquisite flowers, and are of graceful habit. *A. cœrulea*, *Skinneri*, and *chrysantha*, with quite a number of hybrids, are the most noticeable. *A. glandulosa* is perhaps more striking than any other. A bed of it which I saw last summer was bewitching in its beauty. Unfortunately it is not certain to thrive in this climate, having Alpine characteristics.

Among the most useful plants for grouping in the centres of beds are *Anchusa Italica*, *Gypsophila paniculata*, *Lychnis Chalcedonica plena* and *Lychnis Viscaria plena*, the perennial Lupines, Foxgloves, *Rhexia Virginica*, Trollius or Globe Flower, *Asclepias tuberosa*, some of the finer hardy Asters, among which are very beautiful forms, — *Coreopsis auriculata*, *Corydalis nobilis*, *Dianthus barbatus*, or Sweet William, in its many varieties, *Dicentra spectabilis*, some of the more robust Saxifrages, and *Tricyrtis hirta*. Lack of space forbids further detail, though I should like to name and consider very many other attractive species, not generally known. I have endeavored to name the species and varieties which should form prominent features in the hardy garden. The grower of long experience can name many more equally beautiful, but, in the limited space afforded me, this must suffice, as I wish to speak of the hardy bulbs and dwarfer spring-blooming plants, which, after all, are the delight of the garden. These come before summer's withering heat and drought, and, following so soon on the retreat of winter, we can more keenly appreciate the wealth of blossom they afford. Having filled the centres and backs of our beds or borders as I have indicated, let us plant in the foreground, among the dwarfer perennials, as many hardy bulbs as we can afford to purchase and can safely locate.

First and foremost are the Narcissuses. They do not need the praise of any one to make them favorites. Those I will name

are hardy and easy of cultivation. There is an infinite variety of them, presenting slight variations in form and color appreciable only by the expert, but the following are distinct, and will give the best results. All of them, as well as the other species of bulbs that I may name, can be found in any English, and in a few American, catalogues: —

Narcissus bicolor Horsfieldii;
" " Empress;
" " Emperor;
" *maximus;*
" *obvallaris*, or Tenby Daffodil — a splendid flower;
" *incomparabilis* Stella;
" " *plenus;*
" " *aurantius plenus;*
" " *sulphureus plenus;*
" *poeticus ornatus* — the best of this group;
" " *plenus;*
" *cernuus plenus;*

It will pay to plant Narcissuses in well-prepared soil, and give them yearly dressings of manure. The best time to lift and divide them is in August, when they are completely at rest.

With the Narcissuses we can associate in groups *Scilla Sibirica*, of the most brilliant blue, which looks at its best when planted in clumps of a hundred bulbs or more; also *Scilla nutans* and *S. campanulata*, which bloom later; and *Tulipa Gesneriana elegans* and *T. Greigi*, all magnificent species. These are hardy, and do not need to be lifted yearly, like the early Tulips. They are, moreover, far more graceful as garden flowers.

With them we can associate some of the long-stemmed Tulips, which seem to have gone out of fashion along with the queer but striking and artistic Parrot Tulips. Here and there can be planted Crocuses, including *C. speciosus*, *C. serotinus*, and *C. sativus*, and near them the seldom seen autumn-flowering Crocus (*Colchicum autumnale*). These are all invaluable, the flowers being large, showy, and abundant.

Adonis vernalis, a dwarf perennial plant, which sends out its bright yellow flowers almost before the snow disappears, may be associated with these. *Chionodoxa Luciliæ*, or Glory of the Snow, is a brilliant spring-blooming bulb, somewhat akin in habit to

Scilla Sibirica, and with cultivation may excel it; but to my fancy the latter is the brighter and better of the two, besides being much less expensive. With such dwarf-flowering varieties as I have named it is appropriate to plant the Snowdrops (Galanthus) and Grape Hyacinths (Muscari). Of the former, in addition to the type, may be named *Elwesii*, *plicatus*, and *Redoutei*. These are much finer and more distinct than the type.

The Muscari are little known, but they form attractive groups and are fragrant. *Atlanticum*, *botryoides*, and *moschatum* are the best adapted to this purpose. We cannot include the spring-blooming Anemones, and it is a pity, though nothing is finer for cultivation in cold frames with Pansies.

The quaint Fritillarias, Colchicums, and Winter Aconites should be used, and, where there is room, by no means forget to make plantations of Lily of the Valley. How often we see this starved, and often running out, when good culture would achieve the best results! It is exceptional to see it in vigorous cultivation. The mat which it forms should be broken up and thinned out from time to time, and the crowns should be top-dressed yearly with fine manure. It then takes on a different aspect, the spikes of bloom reaching twice the size of those from the starved plants. It is improved by being planted in open situations rather than under trees, as is generally the rule.

In these beds can be dotted here and there groups of Pansies which have been wintered in cold frames; and Primroses of the hardy type can also be used with the best effect. Our winters are too severe for Pansies and Primroses to thrive continuously out of doors, and a cold frame will be found a great help to those who cultivate hardy flowers.

Those who have gardeners, and those who have not, will find the care of a few cold frames involves comparatively little trouble, and in them can be wintered many interesting half-hardy bulbs and plants, like *Narcissus Bulbocodium*, *Geum coccineum plenum*, Hellebores, Violets, Pansies, and, last but not least, Pinks and Carnations. I do not refer to our Perpetual Carnations, used for winter blooming, but to the hardier border Pinks and Carnations, like Lord Lyons, Mary Morris, Mrs. Simkins, Blush Clove, The Governor, and many others. These can be safely wintered in a frame, in pots, and turned out into the open bed in spring, where, associated with the dwarfer plants, they are especially satisfactory and beautiful, furnishing cut blooms in abundance, of the most durable

and delightful character. They can be lifted again in the fall, and transferred to winter quarters; and they are easily propagated by cuttings or layers. Those who have once successfully cultivated this race of plants, and found out their proper treatment, will agree with me that they offset an entire garden of bedding plants.

The cultivation of such flowers as the Carnation, Anemone, Hardy Primrose, Polyanthus, Auricula, etc., is becoming better understood in this country. What seemed insurmountable obstacles to success, in the way of summer heat and winter cold, are overcome by the patience and skill of growers who give their attention to what they undertake. Hardy Primroses are not easy to carry through the summer in this climate, as the red spider has a fondness for them during the hot weather. I have four lights of them now in splendid condition, but they were wet with the hose twice a day during the warm weather, and that is the sole secret of success with them.

Where there are bare spaces in our beds, we have such bright and pretty, close-growing plants as the Sedums and *Phlox subulata* to cover them. Many of the former are hardy in this country, and bloom so profusely that they dazzle the eye with their pronounced yellow, which is the predominating tint. They thrive in any well-made and not over-moist garden bed, and ought to be more generally cultivated, which would be the case if they were better known. *Phlox subulata* is of dense and spreading habit, the rose colored flowers entirely hiding the plant, and forming a mass of color from three to six feet across in favorable locations. There are numerous other low-growing and creeping hardy plants, which should be freely planted in the hardy garden. They serve to greatly diversify the color of bloom and foliage, and are of great practical aid in keeping the surface of the ground cool and moist during the summer.

I have outlined in a very crude way my ideas about the hardy garden, confining myself to essential and prominent points, of use to those who have little knowledge of the subject. All of the plants I have named will give the grower a wealth of bloom from spring to fall, and the bed can be cut from again and again without injury, supplying flowers for the house, where, under the bedding system, there would be few, if any.

Those who desire to add to their beds of hardy plants, and are willing to take the trouble of lifting or renewing each season, may grow in them Gladioli, Tigridias, Asters, Dahlias, Scabious,

Antirrhinums, and any of the finer tender bulbs or annuals. They will certainly give added brilliancy to garden beds and repay all extra trouble. It is important to note that the culture of tender plants is made possible under the plan I propose, while the bedding system crowds out all other plants than those which are necessary to form the lines and masses of color; and this fact has been demonstrated by the gradual disuse of the finer, hardy plants.

All hardy plants can be obtained from such growers as Woolson & Co., of Passaic, N.J., who make a specialty of them; Ellwanger & Barry, of Rochester, N.Y.; and many of our own local nurserymen. The rarer varieties which cannot be secured here are supplied by Thomas S. Ware, of Tottenham; Peter Barr, of London; and others in England.

In this climate spring is the proper time in which to plant all hardy herbaceous plants, as distinguished from hardy bulbous plants. The latter, which are usually at rest in the fall, should be planted in October or early November. English growers recommend fall planting for all hardy plants; but there the ground does not freeze hard, if at all, and no injury is done to newly located plants.

With this last practical hint I will bring my outline of general ideas to a close.

There are many works on Hardy Flowers in which the interested reader will find at greater length the ideas I have endeavored to concentrate; especially in Robinson's "English Flower Garden" he will find the best thoughts upon this subject, which should be read and studied by every one interested in the culture of hardy flowers. Such study must surely lead all to a sense of the poverty and bareness everywhere exhibited under present methods, when we have at hand the resources of this and every other continent from which to draw together under our own eyes, and in our own gardens, the very *élite* of the floral kingdom, whose now unrecognized claim to our appreciation, dowered as they are with all that is graceful and beautiful, must and will, if we but consent to give them room and care, afford us unexpected revelations of the resources, the graces, the never-ceasing pleasures and joyful surprises to be found in our hardy gardens.

DISCUSSION.

In reply to an inquiry as to what plant would make a good edging, Mr. Beard suggested the dwarf variegated Funkia; but he did not particularly favor edgings in gardens.

Mr. Beard went on to speak of the *Aquilegia glandulosa* as he saw it in the Botanic Garden at Cambridge, where nothing could compare with it. Most people make a mistake in transplanting their Narcissuses at about the time when frost comes and they have begun to grow. Those who have never grown Tulips have little idea of their beauty. *Tulipa Gesneriana* will stand as long as it is supplied with food. Crocuses should not be put into beds with a single bulb dotted here and there, but should be planted in groups. The speaker mentioned a garden, which he saw in Baltimore, over a hundred years old, and containing twenty acres, in which were great groups of flowers, such as we rarely see now; among others a mass of *Muscari moschatum*, twenty feet across, the fragrance of which was perceptible a mile away. There are no more beautiful flowers than *Anemone coronaria* and *A. fulgens;* they are cultivated in England as Pansies are here. Last spring Mr. Allan demonstrated that it is possible to grow Auriculas more easily than many other things which are more generally cultivated. Few people realize the fact that bedding plants afford the members of the household but little opportunity to go out and cut flowers.

William E. Endicott said that he did not altogether like edgings, but where they are necessary Sempervivums make the best. Almost any kind will do well for a great many years. The *Erysimum pulchellum* is a dense, carpet-like evergreen, about three inches high, which early in spring throws up numerous spikes of bright-yellow fragrant flowers, and is adapted for edgings. There are also annual species.

Warren H. Manning thought Mr. Beard's paper very interesting and instructive. The dwarf Phloxes deserve more attention than they have received. The light and dark varieties of *Phlox subulata* are very pretty in the border or rockery.

William C. Strong said that the essayist presented his paper in the character of an advocate. He threw all classes of herbaceous plants into the scale, and they outweighed the bedding plants; but the speaker thought we ought to be thankful for bedding plants. He admitted that they had been more popular than they deserved

to be, but he did not advise giving them up altogether. An essayist could say something in their favor.

John G. Barker said that his sympathies were in a large measure with the essayist. The speaker, as years roll on, is more and more impressed with the importance of cultivating herbaceous plants. Though we cannot discard bedding plants entirely, we should use them with discretion. In extending the grounds of the cemetery at Lynn, of which he is superintendent, he makes a special point of hardy trees and shrubs, and has lately planted two beds on lots owned by private parties.

He uses tender plants to fill vases, but thought we might find substitutes, and believes that we can in future create a taste for hardy plants in grounds of small extent. There are places in his own city where the owners, after spending from thirty to a hundred dollars a year for three or four years, for bedding plants, have become discouraged, and given up cultivating flowers altogether, and laid the ground down to grass. If the same amount of money had been paid for hardy herbaceous plants, the result would have been far more satisfactory. The speaker is fond of natural effects, which may often be produced at small cost, as in the cemetery at Lynn, where *Clematis Jackmanni* and Virginia Creepers were planted at the foot of a rough stone wall, which they have covered, and have cost no more trouble than weeding and cutting off the ends of the shoots. The effect is fine, and the expense was small.

He has a large bed covering the basement of his cottage, the background being composed of such shrubs as *Hydrangea paniculata* (the type, which is more erect in growth than the variety *grandiflora*), the larger Deutzias and Spiræas, Paul's Scarlet Thorn, Delphiniums, etc., and, in front of these, Phloxes, different varieties of Irises, *Aquilegia cærulea*, *Spiræa palmata*, *Lilium umbellatum*, and the Japan lilies; with Castor-oil plants, *Eulalia Japonica*, and Cannas where some of the shrubs died out, which give it a sub-tropical effect. Still further in front are the lower kinds of herbaceous plants, and the whole are arranged without formal lines. He had a visit from the late E. R. Mudge, who admired the bed, and wanted one like it, though he had great quantities of Coleus and Achyranthes in long lines of ribbon gardening. From such a bed as the speaker had described he could cut flowers freely and have plenty left. He had some rocks lying naturally, where he cleared out the soil in front and carted

in leaf mould and planted Kalmias on the upper part of the bed, with Rhododendrons, Azaleas, and Andromedas in the lower part, and in this bed many varieties of lilies are planted, which bloom later than the shrubs mentioned. This has proved a very satisfactory arrangement, and is one which many might have.

He did not think bedding plants could ever be dispensed with in cemeteries, but their use can be very much modified, to the advantage of all. The present system of bedding has been greatly overdone, and it is to be hoped that herbaceous plants, which, when properly arranged, can be made to produce the finest effects, will speedily be brought into more general use.

E. W. Wood thought that the essayist could have given just as beautiful a picture of annuals and bedding plants as he had of hardy herbaceous plants. There are two classes of plant-growers; first, those who raise flowers for the market, and, second, the amateurs, who cultivate them for their intrinsic beauty. Fashions change in flowers as well as in dress, but every fashion brings some really beautiful things, which outlive the fashion. A few years ago everything was in lines; and the speaker mentioned a border at the late Alvin Adams' place, where there were five rows of harmonious colors in curved lines, producing a most beautiful effect. Then came solid beds, such as we have seen at Ex-President Gray's. Now the tendency is to herbaceous plants; but the pendulum swings to extremes and we forget the beautiful lines. There are many bedding plants which it will be hard to wipe out. There are some herbaceous plants and annuals that produce good effects in combination with more costly and delicate plants. Sweet peas, for instance, can be used in connection with greenhouse flowers; and we could not spare the Asters.

Mr. Beard admitted that he could do something in the direction of writing an essay in favor of bedding plants. He did not advocate wiping out bedding plants altogether. Herbaceous plants leave room for the very plants mentioned by Mr. Wood; bedding plants leave no space for anything else, and people who spend their money for them get discouraged and give up gardening altogether.

Mrs. H. L. T. Wolcott said that the speakers at these meetings usually address themselves to florists, and as long as florists find it profitable to sell bedding plants we shall have them. Women have been held up to disgrace for making crazy patchwork, but the hideous beds of glaring colors often seen in our public squares

reminded her of crazy patchwork more than anything else. She saw a garden in the county where she lives which was equally objectionable in this respect. It is a waste of time to make such beds, or any other ugly thing. She does not believe in planting flowers in straight lines. She alluded to the beautiful water-lilies exhibited here last fall by Mr. Sturtevant, and said that we ought to have them, in place of the flower beds, in the Public Garden.

Henry Ross said that he did not hear Mr. Beard's essay very well, but should want to read it and make one more patchwork bed. He wanted to go and see Mr. Beard's garden, which, his neighbors said, was wonderful. He believes in shrubs, herbaceous plants, and bulbs, and wants them all, but to give perfection you want flower beds also. The number of plants proposed is too great for small gardens. You cannot get in enough to give a succession of blooms. He has advocated partially doing away with bedding plants and having more herbaceous plants. He likes to visit picture galleries, and on entering one has stood entranced by some beautiful picture, and the same effect was produced on him when he saw the arrangement of bedding plants at Forest Hills, which required as much artistic skill as painting. At Ex-President Gray's he has gone round the grounds and looked across the lawn, with its solid beds of geraniums and background of shrubs and rocks, and the beauty of the scene has so entranced him that he wanted to look at it in perfect silence. It adds to the attractions of bedding plants that we have them only a few months in the year. Taking them away would remove one of the greatest beauties of our gardens. He wants both bedding and hardy plants, and does not believe we can get the best effect with only one; but if he could have only one in a small garden, he would have the bedding plants. Shrubs give bloom but for a short time, but with carpet bedding we can have beauty through the season.

Hon. Marshall P. Wilder was much pleased with the remarks of Mr. Ross. The pendulum may swing too far, as Mr. Wood says. What is the object of bedding plants? Is it not the ornamentation of our grounds? What else will give such a constant show of color for three months? The effect produced by bedding plants cannot be attained in any other way. But the materials must be used with taste and discretion, and the work must be well done. He had never seen anything so beautiful in carpet bedding as at Forest Hills. Mr. Beard's lecture will be a check to the extravagant and injudicious use of bedding plants; but the speaker would

be sorry to see the system which has made our parks so beautiful wholly given up.

John Robinson said that different persons look at the subject under discussion from different stand-points. One has a large estate and another a small city garden, and the latter will plant the portion nearest to the street for beauty, without reference to cutting flowers, and in the rear he will plant anything that he fancies, for cutting or any other purpose. It is possible that most of those who have spoken may be right from their respective stand-points. He does not himself like the crazy patchwork style. He had recently seen near an old mansion a mound of Sempervivums, etc., in the garden, which might as well have been artificial, and the stiff bedding plants at the sides might have been likewise as well made of tin. He did not object to a little border of bedding plants, but to make the whole garden of them is hideous.

Mr. Beard regretted that no one seemed able to take the middle ground, which he was aiming at. At such places as Mr. Hunnewell's the gardeners can combine plants so as to make a beautiful picture; but in small places this cannot be done. The owner of a small garden will get a florist to plant his lines; but you can't cut flowers from bedding Pyrethrums or Alternantheras or Coleus or Achyranthes. His remarks were intended for the owners of small grounds. He has only nine thousand square feet of land, but with the aid of cold frames he can cut flowers from January to January. Those who advocate the use of bedding plants in such places desire the unattainable. He would not come here to plead for bedding plants, but few have tried herbaceous plants. What is a bed of Coleus alongside of a bed of Carnations, that you can cut and smell? Bedding will die of its own weight in small gardens; he would not abolish it in large parks, etc., if he could.

A paper on "Old and New Roses," by Joseph H. Bourn, of Providence, R.I., Ex-President of the Rhode Island Horticultural Society, was announced for the next Saturday.

BUSINESS MEETING.

SATURDAY, January 31, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

Hon. Marshall P. Wilder, Chairman of the Committee appointed at the last meeting to prepare resolutions in memory of Charles Downing, presented a report, which he introduced with the following remarks: —

Mr. President: — I hold in my hand the resolutions which have been prepared in memory of the late Charles Downing; but I ask the privilege of offering a few remarks as my tribute to his memory before presenting them. The decease of Mr. Downing is to me a most afflictive event. He and I were associated together for nearly half a century in efforts to advance the pomology of our country. Succeeding, as he did, his brother, A. J. Downing, whose eulogy it was my sad duty to pronounce thirty-two years ago, he became the author of the "Fruits and Fruit Trees of America," all the editions of which have been dedicated to my name from the first. These circumstances have drawn us more and more closely together by the ties of affection and friendly regard. I knew him well, and I can truly say I never knew a more truthful, conscientious, and upright man in all the relations of life. As a pomologist he was world renowned for his knowledge, accuracy, and good judgment, and he has had a longer experience in the study of fruits than any other man of whom I have any record, either in this or any other country. His books will ever be precious memorials of good fruits and good men, — of a life whose great object was to make others happy in the enjoyment of the beauties and bounties of creation. Charles Downing is gone, but his name will live in the hearts of grateful millions as a benefactor of mankind. Ere long I shall follow him; but I fondly trust that we shall meet again in those celestial realms where we may gather fruits from the trees of life, that perish not with the using. Oh, yes! there is another life above, where we may meet the friends we love.

The resolutions were then read as follows: —

Resolved, That the members of the Massachusetts Horticultural Society desire to express at the earliest opportunity their sorrow at the removal from earth of their late friend and Corresponding Member, Charles Downing, of Newburg, N.Y.

Resolved, That his life has been a blessing to mankind, and that his death is a loss not only to our nation but to the whole pomological world.

Resolved, That while we thus speak we would acknowledge most gratefully the Divine goodness which spared him to us so long, and that although his star has now set, it has left a golden record, which will illumine the annals of pomology while the earth shall bear fruit or the love of nature shall have a place in the soul of man.

Benjamin G. Smith was called upon, and said that in the departure of Charles Downing pomology had lost its leader. The connection of the speaker with the American Pomological Society brought him into close association with Mr. Downing, and he should always cherish and keep alive the memory of their intercourse.

Robert Manning spoke of his acquaintance with Charles Downing and A. J. Downing, many years ago. Charles Downing's acquaintance with the numerous varieties of fruits introduced to cultivation in the last half-century was doubtless more extensive than that of any other person in this country, and it is not probable that any man will, in the future, become possessed of so wide knowledge, for Mr. Downing gradually grew into it as the fruits were from time to time made known. Many of those described in the various editions of the "Fruits and Fruit Trees of America" have been rejected on account of their poor quality; and many possessing much merit have been superseded by better kinds, yet if all were still in existence it would be an unprofitable task, even were it possible, for any one now to undertake to identify and describe them.

Mr. Downing was extremely cautious and conscientious in pronouncing an opinion on the identity or quality of a fruit, and never, among all the multitude of new fruits submitted for his judgment on their quality, rated one higher than it deserved. The speaker mentioned particularly a day spent with Mr. Downing four or five years ago, when they drove around the environs of Newburg, and visited many of the beautiful gardens and grounds there, including the former residence, with the nursery and specimen grounds, of Mr. Downing. In the afternoon they visited the cemetery, a section of which was under the charge of Mr. Downing, where they saw the grave of his brother, by whose side, in the soil which he loved, cultivated, and adorned, Charles Downing's mortal remains were laid.

William C. Strong said there were two prominent American

names which had a world-wide celebrity among pomologists, one of which we cherish as with us today, and the other is now taken from us. Mr. Downing had rare fitness for the special work to which he gave his life. He was not a public man, and rarely raised his voice, even in gatherings of pomologists and horticulturists. The vast amount of knowledge accumulated by him on his special branch of horticulture could not be communicated to any one, and we cannot but ask what becomes of such stores of information? for it is not to be supposed that it perishes with the mortal life of one who has acquired it. We should feel grateful for the example and benefit of such a life, and live in confidence of meeting again.

Joseph H. Bourn spoke of meeting Mr. Downing at the sessions of the American Pomological Society, where the heart and hand of every one was opened to him. His life was spent in communing with the beauties of nature, and all will honor him as the leader in American pomology.

President Moore said that he had not the pleasure of an intimate acquaintance with Mr. Downing, but, from what he knew of him, regarded him as a particularly unselfish and conscientious man.

The resolutions were unanimously adopted.

Mr. Wilder then presented a painting which Mr. Downing had directed to be sent to him for the Society, the following letter being read: —

NEWBURG, N.Y., April 27, 1880.

MY DEAR FRIEND MR. WILDER: —

The fruit painting which I have requested to be sent to the Massachusetts Horticultural Society after my death it may be of some interest to them to know how it was obtained. After the Annual Exhibition of the Newburg Bay Horticultural Society in 1862, Mr. Charles Tice (a self-taught artist of this city) requested specimens of fruit to make a painting, which was readily granted, and after being executed it was purchased by the Society.

The following season it was offered as a prize for the best general collection of fruits, which it was my fortune to obtain.

CHARLES DOWNING.

It was Voted, That the thanks of the Society be presented to William Wait, the executor of Mr. Downing's will, for his kind-

ness and promptness in sending the painting, with the expression of the Society's appreciation of the gift, and grateful acknowledgments therefor.

The Executive Committee reported, recommending that the invitation of M. Ch. Joly to participate in the International Horticultural Exhibition at Paris be accepted, and that the President appoint a delegate thereto. The report was accepted and adopted.

The Executive Committee also recommended that an invitation from Hon. George B. Loring, United States Commissioner of Agriculture, given at the request of the National Cotton Planters' Association of America, to send delegates to a Convention of those interested in Agriculture, to be held in New Orleans on February 10, in the Grand Hall of the Exhibition, to continue one week, be accepted. It was voted that the President appoint delegates.

The Executive Committee also reported in regard to the suggestion in the President's Address, referred to them, whether this Society is not entitled to State bounty to the same amount and on the same conditions as is given to Agricultural societies; that it is expedient to send a member to the State Board of Agriculture. On motion of Edward L. Beard, the President appointed Mr. Beard, John C. Hovey, and Charles N. Brackett a committee to nominate a member. The Committee reported the name of E. W. Wood, who was thereupon elected a member of the State Board of Agriculture for three years.

The Executive Committee also reported their approval of the appropriation of a sum not exceeding twenty dollars, to supply the deficiency in the subscription for Silver Vases for prizes at the Rose Exhibition in June, 1884, this appropriation having been moved at the meeting on the 3d of January, and then referred to the Executive Committee.

Adjourned to Saturday, February 7.

MEETING FOR DISCUSSION.

Old and New Roses.

By Joseph H. Bourn, Providence, R.I.

The roses appropriate to this climate and locality for out-door culture, called *Remontant* and *Hybrid Tea*, are the most valuable, if not the most beautiful, of all the groups of Sappho's "queen of flowers." A lack of the requisite specific knowledge of the most approved and hardy varieties, united to ignorance of their practical treatment, delayed an interest which the rose admirer now manifests when he looks in pleasurable admiration at the improved forms of nature's sweet offering, indubitably excelling the rhodon and rosa thus spoken of in the remote past by the poet: —

> "Dear to earth, thy smiling bloom;
> Dear to heaven, thy rich perfume."

The Greeks adored this flower of the highest antiquity, and the Romans bestowed praises on its loveliness. Anacreon sang its primal birth; Homer extolled its gracefulness, and borrowed its brilliant colors to paint the glowing richness of the rising sun; Herodotus exulted over the sixty petalled varieties which grew spontaneously in the gardens of Midas in Macedonia; Catullus vaunted its charms; and Horace admired "the richly tinted face, whose bloom is soon fled;" Virgil contrasts the pale sallow with the blushing hues, and extols the roses of Pæstum with their "double spring." Those costly ornamental gardens, destroyed almost ten centuries ago, no longer shed the morning fragrance of rose perfume. Nettles and brambles encumber the footpath of the traveller, and, like a poetic memory of the past, the cyclamen and the violet now trail among the *débris* of the old city. Ausonius, writing at the very close of Latin literature, draws from the roseries of Pæstum a picture of "beauty doomed to premature decline," and tells of watching "the luxurious rose beds, all dewy in the young light of the rising dawn-star." Roses bore away the palm from all flowers during the sovereignty of Augustus and subsequent rulers; but Cicero did not approve of the custom, introduced by those who were given to luxurious entertainments, of taking their meals reclining on rose leaves. Verres, a Roman governor of Sicily, gave audiences wearing

wreaths of roses upon his head and around his neck, sitting upon a cushion made of the finest of Malta linen, full of sweet-scented rose-buds. Cleopatra and Nero extravagantly decorated their banqueting halls with rosy ornaments and garlands; and distinguished guests were greeted amid roseate bowers, while the merry dance went round in an atmosphere redolent with roseal odors. Every evidence exists that we must connect the rose with the lore of antiquity; for the ancients preserved its luxury, and it was the ornament of their festivals, their altars, and their tombs; while their poets made it the symbol of innocence and modesty, of grace and beauty. It is probable that the Romans had roses of similar species with some of those we now cultivate, since they practised sowing the seed, as well as propagating by cuttings, by grafting, and by budding. Hot-house growth was also understood and practised, says Seneca; and it was a boast to have carried this flower so far towards perfection as to surpass the cultivators of Alexandria, Memphis, and Rhodes. That the rose never fatigues is shown by the reputation it has maintained through all the ages. Although a hundred generations have succeeded each other, it is still a queenly belle, notwithstanding it did not escape the devastation attendant on the revolution of empires, or the more desolating invasions of the Huns and the Goths.

But while we do not ignore an historical interest in the rose, the subject of more practical inquiry is, what roses can we successfully grow in our gardens? I answer, none but such as are planted under the conditions which the laws of nature certainly require, followed by special watchfulness until the trees become well rooted and established in vigorous growth; and then intelligent study must be given to the varied habits and conditions of growth of each variety. The most popular, because the most useful, roses, are the Remontants, whose special beauty consists in the shell form of the large petals, softly recurving in their glistening freshness of color; and for decorative purposes, the varieties should be the free-flowering kinds, noted for elegance and brilliancy *en masse*, in preference to those possessed of great symmetry of form. The favorites of a generation ago — Madame Zoutman, Blanche-fleur, Chénédolé, and Paul Perras — are unsurpassed to-day in quality, hardiness, and fragrance combined; but the Remontants, on account of their freedom of bloom, are now regarded as the most important of the many groups of roses cultivated. The modern classes of the rose claim no less than twenty species

as their progenitors; and from the proneness of nature's offspring to assume new styles and shades arise individuals differing from their parents. To give a correct knowledge of the rose now so popular, we must become so acquainted with certain types in this group, — which gather together many varieties whose excellent qualities are the result of artificial selection,— as to learn that there are peculiarities that pertain to families which have distinct attributes by which they may be distinguished from others.

In 1842 and 1843 rosarians were delighted with the Baron Prevost and La Reine, now regarded as the oldest types and most enduring and freest bloomers, favorite examples of which are Paul Neyron, Madame Boll, Anna de Diesbach, and Madame Nachury. In 1846 was introduced the Giant of Battles, rich in color, but fleeting, of slight odor, subject to mildew, and difficult to propagate, and, on account of the poor constitution of these varieties, the Prince Camille family have taken their place.

In 1852 the General Jacqueminot appeared as a most valuable acquisition, and from its great popularity this family is now the most numerous of all. Its members are invariably of shades of red and crimson, moderately hardy, and generally highly perfumed. Leading examples are Marie Rady, Pierre Notting, and Marie Baumann.

In the same year originated the Victor Verdier, having numerous descendants, tender, and of slight fragrance, and yet a valuable collection on account of their free flowering, good illustrations of which are Mlle. Eugénie Verdier, Étienne Levet, Countess of Oxford, and Captain Christy. Of all the families it is the best for forcing.

In 1853 the Jules Margottin was a surprise, — almost odorless, and difficult to propagate from cuttings, but making very vigorous plants when budded. Some of our most popular and elegant roses, — Madame Gabriel Luizet, John Hopper, Duchesse de Vallambrosa, Madame Lacharme, Magna Charta, and Rev. J. B. M. Camm, — are of this family.

The flowers of most perfect form presented themselves in the Sénateur Vaïsse type, like Madame Victor Verdier, Mrs. Laxton, and E. Y. Teas, followed by the Charles Lefebvre, of less vigorous habit; the Prince Camille group in 1861, magnificent in their dark velvety shades; prominent members of which are Monsieur Boncenne, La Rosière, Baron de Bonstetten, and Jean Liabaud; but shy bloomers in the autumn; the Alfred Colomb, elegant in

form and color, and odorous; the Duke of Edinburgh, beautiful when grown in a moist, cool climate, but fading under our hot sun; and lastly, the Baroness Rothschild, a superb rose of extreme delicacy, with an exquisite foliage, and of great value to the florist for greenhouse culture.

There is a type recently introduced, more valuable than any I have spoken of, called "Hybrid Tea," of which La France was the original in 1869, of silvery rose color, and having the combination of the Provence and Tea perfumes.

It is now regarded as a decided advance in the art of rose culture to obtain new varieties which shall combine the hardiness of La Reine and Paul Neyron with the free-blooming qualities and fragrance of Bon Silene and Souvenir d'un Ami. In this class nature has been relied upon to accomplish what we wish by sowing the seed promiscuously, producing some flowers that are Tea scented, while others show the Tea blood in the foliage. Roses of this family, which are looked upon with much interest, and which have novelty and promise of usefulness, are the Duke and Duchess of Connaught, Cheshunt Hybrid, Viscountess Falmouth, Madame Alexander Bernaix, Madame Étienne Levet, Julius Finger, William Francis Bennett, and Lady Mary Fitzwilliam.

The roses of the past have been the product of nature, unaided by human effort, while those of the present chiefly come from sowing the seeds of varieties which have not been crossed. The roses of the future may and should be produced principally as the result of artificial fecundation and hybridization. Our aim should be to control and assist nature as far as possible in her tendency toward variation; and in order to obtain new sorts of marked individuality, we should avoid crossing varieties too much alike, for

> "This is an Art
> Which does mend Nature, change it rather; but
> The Art itself is Nature."

Some physiologists are of the opinion that, in hybridizing, the offspring assumes the foliage and habits of the male, while the flowers are influenced more by the female. If this be so, the head and hands may look for any result the mind may suggest; and at least we must conclude, from the advance made within a brief period, by the introduction of new groups, that there is much which is desirable in the rose that we do not already possess, but is yet to be obtained. While the botanist collects and examines

the productions of nature, and arranges them in classes and orders, which he again divides into genera and species, pointing out their properties and uses, the florist applies the art of culture, with the view of fashioning them to his own taste. Since nature's plants are all open to improvement, the originating new and improved kinds by the product of a mixture of two different species is one of the most fascinating departments of the floricultural artist; who is moving continually amid ideal scenes, knowing what forms he wishes, but not what he will obtain.

So every year the florist has disclosed some new and progressive charm; and while he has caused an increased interest in roses generally, and a better demand for them, yet they are rarely seen in the perfection of their loveliness, from a want of judicious selection and treatment. The roses of all lands are with us, but changed in their constitution, — some weakened, others strengthened by a change of diet, climate, and care. The rosery should be both exposed and sheltered, a place of sunshine and of shade; the centre clear and open, and the protecting screen around. The requisite conditions of a spot selected for rose culture cannot always be judged by the mere texture, depth, or character of the soil, even in conjunction with climate and situation; for it is more a matter of actual experience than calculation. The rose trees should be so arranged that the sun will shine upon them from its rise to meridian, and then leave them in shadow and repose. The hardy may preferably be planted in the autumn, the tender in the spring. Set plants of one or two years' growth, and prune before planting, for the shortening of the shoots and roots reduces the number of buds which draw upon the sap, and a more vigorous growth follows. Choose a day when the earth is easily worked and friable, for planting. Place the roots three to six inches under the surface, and set deeper in light and dry than in strong and moist soils. Transplanting should occur once in five or six years, but budded and grafted varieties more frequently become impaired; the wood, annually weaker, does not attain that maturity and size necessary to the production of fine flowers. If we carefully remove a tree in this condition we shall find large, sucker-like roots, almost destitute of fibres, which have been burying themselves in the earth each succeeding year. Removed farther from the reach of nourishment, the bush dwindles and becomes debilitated, which is remedied by replanting in the autumn, cutting off the suckers and pruning the roots.

Roses may be grown to perfection in ordinary garden soil, but they must be cultivated, and the ground thoroughly drained, dug, and fertilized, and rendered as porous as possible. In clay loams the use of sand, lime, soot, burnt earth, and loose, light vegetable matter, like leaves decayed to mould, will alter the texture and improve the quality. At the time of planting strong fertilizers are not required, but when the trees have become established they like rich soil, which should be made light for the delicate rooting kinds, and more tenacious for the robust and hardy; and it would be reasonable that the classes and varieties differing in their nature should have more than one soil, that each may receive that which is the most suitable. A knowledge of the several ingredients of the earth in which our bed of roses is planted would afford desirable information, in order that we may apply at the right time the proper kind of fertilizers; and a renewal of the surface soil with old pasture loam every two or three years will supply important elements unattainable by any other method. The upper earth should be kept light and loose, in order to readily admit those constituents which cause growth, and the soil should be filled with such particles of food in the particular form necessary to unite with the air and water, avoiding the application of more fertilizers in a soluble state than the plants can consume. A critical observer and careful grower might say that the earth should be filled with stimulants in different stages of decomposition, that the tree may, in all conditions of growth, have plenty of food; to be applied often, in a weak, liquid form, when the plants are growing and especially flowering. An application of bone and potash acts favorably when the earth is removed from the bushes in the spring. A frequent sprinkling of water at evening adds health to the foliage, and is a preventive of insect destruction; and it is best to imitate nature, and wet the earth thoroughly only when dry, withholding water until again needed.

Pruning is the most important and difficult operation to perform with success, on account of the extent of the genus, made up of varieties differing so much from each other in habit and character; and as so much is dependent on circumstance, much must be left to the judgment of the operator. Autumn and spring pruning both have their helps and hindrances, for with some roses the latter is unfavorable to the development of branches and flowers. It is a good rule to prune all but the sensitive kinds in the autumn, but to leave the shortening of the shoots until spring. An improved

symmetrical form is obtained by disbudding, or rubbing out some of the eyes when swelling, which method of pruning takes the place of thinning out the weaker branches, whereby the remaining buds produce stronger wood, and consequently there is a healthier and larger surface of foliage. The important results which arise from pruning are, the maintenance of the tree in health and vigor, giving a form agreeable to the eye and advantageous to the development and display of its blossoms, and securing an abundance of fine flowers. The most desirable and pleasing form for trimming is that of a pyramid, or half oval, where all of the shoots and branches receive a due portion of air and sunlight; and we should never forget to look to the name, to know the habit and character of the variety to be pruned, to ascertain if it is a strong or weakly grower, and whether or not the finest flowers are produced indiscriminately from the low, middle, or top germs.

There is no royal road to the elegant garden of roses. Although a more generally diffused taste for the cultivation of this charming race of plants is manifest, few have a sufficient knowledge of their habits to know how to grow them intelligently. Besides, we must see these choicest gifts of nature to be acquainted with their excellences. In most of our gardens there are no special attractions to the rosarian, but a happy, peaceful home to the entomologist. Yet there are pleasing spots which receive studious attention, where nature seems to have expended all her wealth in rendering the earth blossomy beautiful with the simple loveliness of the roses; most elegant at sunrise, when newly dilated by the breath of morn, and showing all that freshness in which consist peculiar charms, too soon vanishing before the radiance of a summer's sun. In their purity and splendor these souvenirs of love and friendship blush and gleam amid their glossy leaves.

I am often asked what varieties are to be most commended for garden culture. All of the several types have some peculiar and distinct characteristic which is valuable. I should therefore elect from the different families according to the number desired, regard being had to variety of shades, hardiness, and freedom of bloom, giving preference to those whose petals are abundant, and regularly and gracefully disposed; and, usually, the thicker these are the richer the tints and the longer the flowers endure. Dark roses, as a rule, are the first to fade; but Louis Van Houtte, Marie Baumann, and Alfred Colomb rank high for permanency of color. The rose shades that are the most durable are illustrated in Marquise de

Castellane, Rev. J. B. M. Camm, Marguerite de St. Amand, and Jules Margottin; and from the pink choose Eugénie Verdier, Baroness Rothschild, and Comtesse de Serenye. Jean Liabaud, Baron de Bonstetten, John Hopper, La Rosière, Madame Gabriel Luizet, Paul Neyron, Marchioness of Exeter, Thomas Mills, Anna de Diesbach, E. Y. Teas, Maurice Bernardin, Madame Hippolyte Jamain, Charles Darwin, Abel Carrière, Madame Victor Verdier, and Monsieur Boncenne are grand garden roses; while Marie Verdier, Lady Sheffield, Duchess of Bedford, Madame Scipion Cochet, Alfred K. Williams, Duke of Teck, Pride of Waltham, Mrs. Jowitt, Harrison Weir, Merveille de Lyon, Ulrich Brünner, Earl of Beaconsfield, Helen Paul, and Countess of Roseberry are less known, but quite fine and estimable. Some of you are familiar with many of the new roses, — Antoine Mermet, Alexandre Dupont, Joseph Metral, Louise Cretien, Madame Delavaux, Souvenir de Leon Gambetta, Violette Bouyer, Centenario de Camors, Fanny Giron, Marie Lagrange, and Ernest Prime. A few of the new French Remontants of 1884, which will soon be presented for your approbation, are, from Pernet, the Baronne Nathaniel de Rothschild, a large, globular, delicate rose color; from Levet, the Madame D. Wettstein, cherry red; from Gonod, the Étendard de Lyon, a large, fine shape, purplish crimson; also the Souvenir de Labruyère, vivid rose, centre darker; from Dubreuil, the Admiral Brisbet, a fine-scented, pinkish crimson; and from Liabaud, Docteur Dor, large, tea-scented, dark cherry red, shaded darker; Madame Pitaval, light cherry red; Madame Stinouge, purplish red, and Monsieur Hoste, velvety crimson. From Guillot, the Gloire Lyonnaise, fine form, free and scented, creamy white, with yellow centre. Every season brings out novelties, but few real gems, mostly imitations of familiar acquaintance; and we must not expect to meet with the improvement of former years, but must rest satisfied with the more gradual development usual among plants that have been long in cultivation.

With all the beauty which the rose possesses, we cannot speak of perfection in any one variety, and the fine qualities that are manifest in one season are not likely to be obtained in another; while hindrances to good culture are constantly presenting themselves to the most experienced and best informed. Some varieties will flower only in June; others are handsome but not fragrant, like Charles Lefebvre and Étienne Levet; the petals of some fade as soon as exposed to a shower, or a strong mid-day sun, like

Madame Nachury, and Gloire de Bourg-la-Reine; others do not open well, like Pierre Notting, Empress of India, and La France. Some are slow growers, others have delicate stems. A few are subject to mildew, which spreads and affects others, and should not have a place in the garden, like the Countess of Oxford, Sir Garnet Wolseley, and Caroline de Sansal. Nearly every best rose that is grown has some defects, and many are somewhat tender, like Marquise de Castellane, Baroness Rothschild, and Eugénie Verdier. The best and most certain means for preservation of rose trees that have a delicate habit is to give plenty of air and sunshine, the influence of which agents hardens the texture of the wood and renders it impenetrable to insects. The largest intelligence, united with constant vigilance, will reward us annually with only a few flowers which have the requisite qualities of richness and permanency of colors combined with fulness and gracefulness of form, and sweet odor.

Autumn flowers, I am inclined to believe, are improved when grown on trees raised from cuttings rather than from the bud or graft; for those that are worked are in an artificial condition, and less able to contend throughout the season with adverse influences than such as carry their sap in continuous currents. The luxuriantly growing wood should be allowed to bear moderately until the time for the late blooms. François Michelon, Fisher Holmes, Monsieur Noman, Marguerite de St. Amand, Victor Verdier, Boieldieu, Annie Wood, and Alfred Colomb are esteemed for large, handsome, late flowers.

When blooming in native wildness and simplicity the rose is universally admired by the botanist, while it has many attractions to the casual observer; and the wild roses of our woods and hedges, though of a simple type, are the impersonations of elegance and beauty. They adorn the solitude where they grow; and glancing, half concealed, from their green bowers must have reminded the Pilgrim, in the wilderness, of home. In connection with the delightful study of botany, our lovers of scientific explorations and of beauty in the field could add attractive graces to our highways and by-ways by adopting the customs of the Hungarians, among whom the finest kinds of roses are found blooming in unfrequented places, produced by budding the wild varieties, which the ladies of rank and fashion do in their rambles.

We cannot but decide that the Remontants are of a most heterogeneous character, and that the varieties are so different in

their nature as to require varied culture and treatment. Our remarks have had special reference to out-door growth; but there are some of this class that do not expand their flowers freely in the open air, though beautiful when forced; while others, of rare excellence in the garden, are of little worth for the greenhouse. The Baroness Rothschild, Édouard Morren, Mabel Morrison, Hippolyte Jamain, Madame Gabriel Luizet, Duke of Edinburgh, Magna Charta, Thomas Mills, Anna de Diesbach, Mrs. Harry Turner, and Anna Alexieff, have a healthy habit for forcing, are of pure colors, and of full, symmetrical form. Early spring flowers of these and other free-growing varieties are obtained by cutting well-ripened wood from out-door trees late in the autumn, and grafting upon the Manetti and other stocks, which have plenty of fibres to gather food for their support in December. The cultivation of this class by artificial means has been yearly increasing to meet the demand for these sweet reminders of our summer time. They are called by florists, in the winter, fancy roses, and produce sparingly flowers of surpassing elegance, which command large prices, on account of the demand for them and the extra care requisite to produce good specimens. Attention is now being given to these beautiful but costly dainties of nature in your vicinity, and distinguished success has been obtained by your honored President, and others, producing better flowers than are grown from like varieties in the open air.

The arrangement of roses cut from the tree is a matter of taste in regard to which there does not exist a unanimity of sentiment, else we should be wearied with a continued sameness. But there are certain fixed laws that regulate the decorative art in flowers. Too many blooms are used for single baskets and bouquets, where they are crowded together promiscuously, exhibiting a mass of petals, the form and coloring of each separate flower being indistinct, with little of its own foliage to render the proper effect. The more nearly roses are shown as they naturally grow the better effect they produce. The stiff, artificial stem, without the leaf of the flower, propped up by smilax, ferns, and other green than its own, is not like nature. Hand bouquets of roses and buds are more beautiful when made of the same variety with its own foliage, stems long and loosely bunched, having a small number, well chosen, of sweet odor. A collection in basket form, or for parlor decoration, had better lack a flower than have one too many, the object being to form a graceful, refreshing, and suggestive picture, preserving an "easy negligence mixed with art." Show each

bloom separately, reposing in its own green, and remember that a few colors have a prettier effect than many. If a combination is thought to be desirable, red, white, and buff are pleasing. The beauty of roses is much impaired when they are displayed in masses. As a rule, if there are to be many flowers, use the delicate shades; if few, the deeper tones; and we should not forget that large and choice roses are always most effective when displayed in standards proper for their reception as single specimens.

Born in the East, the rose has been diffused, like the sunlight, over all the world. Syria, according to some writers, took its name from Suri, a species of rose indigenous to that country. From the Celtic word "rhudd," signifying red, we trace a resemblance in the names by which various nations distinguish this plant, — Rhodon, Rosa, Rosier, Rosajo, Rosal, Rosiera, Rosenstock. Classical writers, from Homer to Horace, extol the rose above all other flowers; and those who loved beauty most have been its greatest admirers. The rose is "the honor and beauty of flowers," says Anacreon; and it is spoken of at the Persian feast as

> "The floweret of a hundred leaves,
> Expanding while the dew-fall flows,
> And every leaf its balm receives."

In the beginning of the ninth century Charlemagne manifested an appreciation of this particular flower, and later the hanging gardens in Hispania, under the Moorish dominion, were richly and heavily decorated in brilliant bud and bloom of roses. How elegantly Cowper describes the expanding rose, filled with the raindrops of the passing shower, as "weeping for the buds it had left with regret;" and Cowley sings of a rose, surpassing those we have on earth, that the angels scattered from gilded baskets: —

> "Some did the way with full-grown roses spread,
> Their smell divine, and color strangely red;
> Not such as our dull gardens proudly wear,
> Whom weathers taint and winds' rude kisses tear."

The Empress Josephine was passionately devoted to the rose, and sought for every novelty which the nations of Europe possessed, in order to gratify her pleasures in the garden at Malmaison; and it is said of her, that in all her greatness, a single rose in her hair surpassed the jewelled diadem. In almost the last

letter Mr. Longfellow penned, he spoke of arranging some wonderful Newport flowers in his library under the lamps, " — fancying myself back in the days of the *troubadours* playing at the floral games of Toulouse."

Memory bears us up the stream of time, when we are to believe the roses in the famous gardens of the East were as pure and steadfast as now, relics of Eden's bowers, " sweet nurslings of the vernal skies, bathed in soft airs." The same resistless beauty was doubtless manifest, flaunting in the shades of early morn; the same sunshine loved them then, because they were so fair; the same closing and fading of the petals were descried under the dropping of the dews in the gloaming. The ages certainly have not detracted from the loveliness of beauty's queen, nor has constant association made the rose less alluring. The admirer of the rose in summer time in this favored locality can sit before his favorite flower in mute admiration, and find refreshment, rest, and peace in the parterre, as he surveys with delight his collection, whose brightness and sweetness bring tender memories, solaces, and hopes, while the reflections awakened by floricultural nomenclature afford new sources of enjoyment. He seems for a brief period to dream of other climes, in the companionship of distinguished friends and acquaintances, all attired in richest apparel. The counts and countesses, dukes and duchesses, princes and barons, lords and marquises, queens and empresses, sultans and presidents, cardinals and doctors, generals and captains, senators and reverends, ladies and knights, madames and mademoiselles are a royal family, grand and graceful when expanded to fullest beauty " of flowers purple, red, and white, like sapphire, pearl, and rich embroidery," amidst rosebuds blushing through their bowers of green, more lovely still the more concealed.

> " There a noble crew
> Of lords and ladies stood on every side,
> Which, with their presence fair, the place much beautified."

And so we talk, when the earth is clad in snow-white robes, " of the sweet season that bud and bloom forth brings." Now our thoughts again revert to the delights of spring and summer, full of sunny days and roses. They carry us also to the primitive home of our cherished flower, where the objects of admiration are never exhausted; where the Syrian and Musk rose, replete with

dewy wine, cover the sacred ground. No frost there visits the grass. Emblems of life continually exist, and roses glow in gem-like tints, hanging in cataracts from the gray walls of the fortified villages, topped by a crown of foliage. Amid such scenes the traveller exclaims in wonder, "Who can paint like nature!" as he views this shadowy curtain of gorgeous colors on mouldering stone-work when the sun goes down behind the amethyst-tinted hills.

"Soon we shall see the swelling buds,
As one by one their tender leaves unfold;
As if they knew that warmer suns were near,
Nor longer sought to hide from winter's cold."

Transitory, almost ephemeral, is a rose's brief life of joy; but its sweetest gift is preserved in soft perfume as we drink the breath of the crushed, roral leaves, after they have fallen and withered.

"She did not care to see their glorious hues,
Fearing the richer perfume she might lose."

"Yet, though thou fade,
From thy dead leaves let fragrance rise,
And teach that virtue lives when beauty dies."

"And yet may sweet things with us stay;
As in the garden roses blow
In white and red, — just as they lay
In white and red so long ago."

Discussion.

Edward L. Beard said, that the greatest obstacle to rose culture is that people do not understand the method of keeping the bushes free from insects. This is the greatest necessity in rose culture, and nothing but eternal vigilance will effect it. People complain that their bushes are eaten up, and want some easy method of keeping them clean; but there is no royal road to this result. Roses require pruning, and sometimes get soil-sick, and the soil must be renewed; but keeping them clean is a more important point than either of these; it is the great necessity to make rose culture popular. Insecticides must be constantly applied, and

the best is soapsuds; all that is made in the house should be saved, to give the rose bushes a bath two or three times a week. The next best insecticide is water from the hose. Tobacco water and hellebore powder are excellent, but whale-oil soap, unless carefully applied, is destructive of the foliage as well as the insects. Rose-bugs must be picked off by hand. There is a beetle which cuts the foliage at night, and drops to the ground, but, unlike some insects, there is only one crop of them. The speaker picked a quart one night, and the next about half as many; the third night only a few; the fourth night none were to be found, and there were very few the next year.

William C. Strong said that Mr. Bourn's paper contained a great deal of eloquence and a great deal of practical information. His experience was that pruning roses in the fall is injurious: the winter often kills a great deal of wood; and we can see better in the spring whether any pruning is necessary beyond removing the dead wood. His experience also is that roses grafted on the Manetti stock, even the strongest growers, — General Jacqueminot, for instance, — give the best results. He would add to the list of desirable roses the *Rosa rugosa*, which, though the flowers are single, has admirable foliage, and is surpassingly beautiful as a shrub.

John C. Hovey agreed with Mr. Beard in regard to insects. He asked why so little is said of the white Cottage rose, which he had seen in old gardens, and thought very desirable. All the plants that he had ever seen were old. He had been unsuccessful in raising it from cuttings or seed.

Benjamin G. Smith said that among his earliest recollections was that of the Cottage rose. He has a plant which he got twenty-eight years ago. He regards it as a most satisfactory variety.

Rev. A. B. Muzzey had listened with much interest to the historical account of the rose, given by the essayist, from which it appears that it has been a favorite in all ages. Undoubtedly it is the favorite flower of a majority now. In his father's garden were two large, white rose bushes, from the flowers of which rose-water was made; but much less of this is made now than formerly. Roses were grown in the house more successfully in former years than in modern times; in his early days he knew a lady who cultivated them with great success, but, although she continues the same methods, she fails. The speaker asked what is the cause of this change — is it the atmosphere, or the food, or the illuminating

gas, or is it due to the varieties? It is extremely desirable to ascertain the cause of failure, for nothing is so delightful in the parlor or study as blooming roses.

John C. Hovey had known a number of cases similar to that mentioned by the preceding speaker, where, before gas was introduced, roses did well. He thought the cause of failure was something put into the soil or taken out of it.

Hon. Marshall P. Wilder thought the paper which had been read a remarkable one, historically and scientifically, and also for its beauty and eloquence. He did not know how he could controvert anything that the essayist had said. He was surprised at the close study which the writer had made of the various classes of roses. When the paper is examined it will be found that he has given us just the information we want. Mr. Wilder concluded by moving a vote of thanks for this remarkable paper, which was unanimously passed.

President Moore said, in answer to Mr. Muzzey's inquiry, that the use of coal stoves, air-tight stoves, furnaces, and gas had made it more difficult to grow roses and other plants in the house than formerly, but they can be grown in an old-fashioned kitchen with a large chimney and a wood fire, as well as ever. The Cottage rose is difficult to propagate by cuttings, but easy by layers. It is very beautiful for a fortnight in June.

Mr. Strong did not agree with the President in regard to furnaces; he thought them one of the best protections against impure air. A well-constructed furnace, with a wrought-iron dome of sufficient size, an ample evaporating pan, and introducing plenty of fresh air, will give us the best atmosphere we can have in-doors in cold weather. Plants in the house must be kept free from dust, and will want showering and care to keep away the red spider, — the worst of all insects.

Mr. Hovey said he did not refer to gas from a furnace, but to illuminating gas.

Joseph H. Woodford said that in his experience it was impossible to grow roses in parlors; they can be grown in the kitchen, where the air is cooler and moister and changed oftener. In outdoor culture they must have very rich soil. In the fall he banks them up with earth six or eight inches high, and fills the space between the rows with good strong manure. In the spring the ground is levelled, and the portion of the plants covered will be found to be unhurt by the winter. All Remontants are tender and should be

protected. He would never prune roses in the fall under any consideration. The greatest trouble is from insects. He had succeeded in keeping his roses clean by applying hellebore with a dredging-box early in the morning. Three applications should be made, — the first before the buds form, which kills the first insects that come; the second before they bloom; and the third after blooming, — which will be sufficient.

The Chairman of the Committee on Discussion announced that the subject for the next Saturday would be, "Methods of Fruit Growing;" to be opened with a paper by Professor S. T. Maynard, of the Massachusetts Agricultural College.

BUSINESS MEETING.

SATURDAY, February 7, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, President MOORE in the chair.

The Annual Report of the Treasurer was read by the Secretary, accepted, and referred to the Committee on Publication.

ARTHUR W. BLAKE, of Brookline, and
DAVID NEVINS, of Framingham,

having been recommended by the Executive Committee as members of the Society, were on ballot duly elected.

Adjourned to Saturday, February 14.

MEETING FOR DISCUSSION.

The President having retired, the chair was taken by Vice-President BENJAMIN G. SMITH. The following essay was read by the author: —

METHODS OF FRUIT CULTURE AND FORESTRY.

By Professor S. T. MAYNARD, Amherst.

In travelling through many sections of Massachusetts, and in fact of all the New England States, one of the most striking

features that meet our view, outside of the villages, is the vast amount of waste or unproductive land. On every hand we see rough, stony hill-sides, almost barren plains, brush-covered pastures, and swamps that produce little but brush and coarse weeds. In many sections much of the land is becoming dotted over with forest trees, and showing unmistakable signs of total neglect.

In looking over the census of Massachusetts, for 1875, I find that at that time there were in this State alone 1,469,988 acres of unimproved land, exclusive of that so covered with trees as to be classed as woodland. This land is devoted principally to pasture; but the income derived from this source must be very small, for I find that five acres, on the average, are required to support each farm animal pastured for six months, including sheep and calves. The average value of such land is given as $27 per acre, and probably ranges from $5 to $50. The question then naturally arises, What can we do to improve this land, and how can we get a larger income from it? Since the use of chemical fertilizers has become general, much of the smooth land that can be cultivated has been taken up and made to produce paying crops.

Throwing out the 469,988 acres as being free from stones, so as to be easily cultivated, which, I think, is a fair estimate, we have left 1,000,000 acres, that, in its present condition, cannot be profitably cultivated. It is generally conceded among farmers that pasture land cannot be profitably improved by the application of special fertilizers and seed without cultivation, or at least very few follow in that line of improvement, so that we must look for other means for an increased income. Two ways present themselves by which such land can be made more profitable: First, by planting forest trees; and, second, by planting with fruit trees.

When I began this paper I had in mind the title, "Methods of Forest Planting and Fruit Growing in Turf," and you will pardon me, I know, if I touch upon the matter of forest tree planting in turf before I consider the methods of fruit culture adapted to such land.

Probably all of the gentlemen present can recall instances where the native White Pine, the Austrian and Scotch Pines, the Norway Spruce, the Larch, the Elm, Maple, Ash, and other trees have been planted in turf, and have made a satisfactory, and in some cases a remarkable, growth. One or two examples will suffice to

illustrate this point. Upon a poor, gravelly hill-side, on the college farm at Amherst, where nothing but brambles and white birches would grow, were planted, ten years ago, a lot of European Larch and Scotch Pine trees, about two and a half feet high. The trees were taken from a nursery about half a mile distant, one squad of students digging them, while another squad was planting. The holes were dug about fifteen inches deep and eighteen inches in diameter, and after planting the trees the soil on the upper side of the hole was moved to the lower side, to form a basin to catch the water as it runs down the slope. Nothing was applied in the way of additional fertilizing material, but the surface soil was used first about the roots, and the subsoil spread upon the top. With the exception of about a dozen trees, all lived, and after about two years began to grow rapidly. This lot last fall furnished a flagstaff for the barn at the Experimental Station, from one of the larches, thirty feet long, seven inches in diameter at the base, and two and a half inches at the top. Many of the Larch trees are larger than this, and the lot will average about thirty-eight feet high, and six inches at the base. The Scotch Pines, planted at the same time, upon the same land, have not reached as great height, but are of greater diameter, and have made more branches. Had a mulch been used after planting, or a little bone or some other special fertilizer been added, the growth would have been much more rapid the first two years; and they would now be larger, as is shown by a few specimen trees from the same lot that were planted on equally poor soil, but which were mulched, and have had a few shovelfuls of compost put around them at different times. One of these larches now measures eleven inches in diameter at the base, and forty feet high, and there might be cut from it three lengths for posts: one large stick eight feet long, that could be sawn so as to make two posts five and a half inches thick at the base and three and a half inches at the top, one round post seven inches thick at the base, and five inches at the top, and one good vineyard post; the whole worth at least fifty cents per tree. Reckoning the average value at one-half the above, and estimating 1,000 trees to the acre, we have a value of $250 per acre.

In 1871 a lot of white pine seedlings were taken from an old pasture and planted along a hedgerow where an old Virginia fence had been removed. The ground was full of roots of all sorts of brush, which made the digging of the holes very laborious. Three rows were planted, about five feet apart each way, the trees

when planted being about three feet high. None of them died, and now their average height is about thirty-three feet, and the diameter at the base about nine inches.

Of deciduous trees we may see in almost every village examples of rapid and healthy growth in turf land. Where the growth has been unusually rapid may also be found evidence of a great abundance of plant food; but perhaps no greater amount than is often found in pasture land that produces such luxuriant crops of brush as many of them do. I would not advise the attempt to grow any crop on a soil that has not in it, naturally or otherwise, an abundance of plant food, but I feel certain that land which will produce large crops of brush naturally, may be made, with a little outlay, to produce a satisfactory growth of either forest or fruit trees.

In planting such land it is essential to success to select that which is suited to the growth of the kind of trees desired. Before planting I would line out the land, by stretching a wire or cord across the lot and setting stakes, to secure uniform intervals between the trees. Then, if there is much brush, I would remove it along the line of the row. If time and help are limited I would cut only a path two or three feet wide, and remove the rest when other work was less pressing than during the spring. One of the best ways to get rid of the brush is, in the fall after the ground is frozen, or in open winters, when there is no snow upon the ground, to take a broad-bladed bog-hoe, grind it sharp, and hoe off the brush close to the surface of the ground. All the smaller brush like that of huckleberry, blueberry, sheep laurel, etc., may be easily cut close to the ground, and many of them will fail to start again; while the grass and other herbaceous plants will work in rapidly and assist greatly in choking out brush which starts later into growth. The brush should be raked up in piles between the spaces for trees, and the holes dug in these cleared paths. It may look like a great task to dig holes in much of our rough, stony land, but as it is of little consequence whether the trees are exactly in lines or not, the variation of a few inches will almost always enable us to dig holes at sufficiently near the proper distance, and very few spaces will have to be passed by. A man with proper tools — a stout sharp spade, a bar, and a bog-hoe with a pick on one end — will dig from two hundred to five hundred per day. In a piece of newly cleared woodland, where the rocks were as thick as they will average in our pasture lands, and the ground was full of roots of the heavy growth of wood re-

moved, I employed a man last spring who could dig two hundred and fifty holes for apple and peach trees in a day. This was rather more than I wanted to do myself, but I did succeed in keeping up with him for about two days. From this experience I am satisfied that in much of our old pasture land an ordinary laborer would dig more than that number per day. After the trees have been planted, the brush and other coarse material should be drawn close up under them, and if the soil is very poor it would probably be found a good investment to use from a quarter to half a ton of fine ground bone to the acre at the time of planting.

The second method of utilizing the above-described lands is by planting them with fruit trees. Of all the various branches of agriculture or horticulture in New England, fruit culture, I believe, offers the greatest inducements for the future. Nowhere in the world can fruit of such quality and beauty be grown as our apples, pears, plums, peaches, and cherries, and the improved transportation facilities, and methods of preservation, have very largely increased the market for it.

The history of the cultivation of all fruits shows us that "the more *good* fruit the people have, the more they want;" and there is almost a certainty that good fruit in the future will bring paying prices.

For several years past I have taken the position, that, with the use of chemical fertilizers, and the brush, grass, and other coarse material growing upon much of our stony land that *cannot* be cultivated, such land can be made to produce paying crops of fruit; while the land that *can* be cultivated, should be used for other purposes. I am still almost alone in this position; yet I can see some marks of progress, and am more and more convinced that a system can be worked out by which entirely satisfactory results may be obtained.

After an extended examination of the apple trees of many sections of the State I find, as a rule, that the oldest, most healthy, and productive trees are generally growing in turf, and that in a great many old pastures seedling trees are springing up, and growing with great vigor. There seems to be little difference in the vigor and hardiness of trees growing in turf, whether they started from seed where they are now growing, or were transplanted, the condition of the soil being the same.

In orchards that have been cultivated for a few years and then seeded down for a time, and this process kept up, the trees soon

become weakened and liable to disease, and often die long before they are fully grown.

The vigor with which a newly transplanted tree starts into growth — other things being equal — depends upon the amount of moisture and plant food in the soil, in condition for the roots to take it up as needed. Trees do not start into growth as quickly when planted in turf as when in tilled ground, for two reasons: first, the moisture is rapidly carried off by the numerous leaves of the grasses and other plants; and, secondly, the plant food is absorbed by other active roots as fast as it is prepared.

In cultivated land the moisture is kept from escaping by constant stirring of the soil, and, there being no other feeding roots in the soil, the trees get an abundant supply of plant food as it forms.

The question, then, to be answered, in the turf system of planting, is, *can we supply the proper conditions of moisture and plant food?* If we can is there any reason why our hill-sides may not become covered with productive orchards and profitable forest plantations?

By the addition of a few handfuls of fine ground bone, or bone and potash, to the soil used in filling around the roots of the trees at planting, and by the use of mulching material, both of the above conditions may be easily and cheaply obtained, and trees thus planted will make as rapid growth as in cultivated land, and be much more hardy, and live to a greater age.

If there is not enough mulching material on the land it may often be easily obtained from an adjoining lot, or such substances as machine shavings, sawdust, spent tan, wool waste, bristles, straw, leaves, and other like materials may be used. It will be urged by some that the effect of the mulch will be to cause the roots to run so near the surface as to be injured by the extremes of our climate. This might be the case upon land that is cultivated, but here it is only needed until the trees have become well established, and is spread only a few feet around the tree. If the land is given up to the growth of trees only, the decaying grass and leaves that fall down annually will keep up the fertility of the soil until they begin to bear, when, if annual crops of fruit are to be expected, additional plant food in some form must be used. Should the brush growing upon the land after a few years not be needed for mulching, it may be piled up while green, and in a few more years will become a mass of vegetable mould, that will make the best kind of top-dressing for fruit trees or other crops.

As we know little of the methods of planting those orchards now found succeeding in turf land, I will give the details of a plan based upon the experience of planting a twenty-acre lot recently cleared of heavy wood, and a part of an old pasture now in process of preparation for spring planting.

In planting fruit trees we must select land suitable to the growth of the fruit we intend to produce. The apple succeeds best upon a deep, moist, sandy loam; the pear, plum, and quince upon soil heavier than is required for the apple, and the peach and cherry upon lighter and higher land. The process of clearing and planting is as follows: With a reel containing No. 14 galvanized wire, with drops of solder at intervals of fifteen feet, to mark the places for stakes, the land is laid out by first staking off two opposite sides, at proper distances; then from side to side stretch the wire taut enough to raise it above obstacles like large stones, stout brush, etc. At intervals of thirty feet put a large stake for an apple tree, and midway of each space put a smaller stake for a pear, plum, peach, or cherry tree. Then fifteen feet from this set a row of all small stakes for trees of one kind, of lesser growth than apples, and then fifteen feet from this line stake out a line like the first. In this way we have the spaces marked out for apple trees thirty feet apart, and the others intermediate. The distance for the apple trees will be considered by many to be too small; but if, instead of pruning the trees by cutting out only the inner branches as is commonly done, so as to form a straggling head, the end branches are occasionally headed in, there are but few varieties that will need more than that space. After having the land staked out, if there is much brush — and the more small brush the better — it may be cleared off as suggested for forest-tree planting. If the winter offers no time for cutting the brush, as described, it may be mown off with a common brush scythe in August. Cut at this time, many young, tender shoots are thrown out, and, growing late, are often entirely destroyed by the cold. The process of digging the holes has already been described, and should begin as soon as the frost is out of the ground, or it may often be done the fall previous to planting.

It is generally advised not to use any fertilizing material, except the surface soil, in planting fruit or ornamental trees, but I have never seen injury result from the use of well-decomposed manure, ground bone, or bone and potash, in moderate quantities, mixed thoroughly with the soil. Before planting, one to five handfuls of

ground bone, or one to three of bone and potash, may be thrown so that a portion shall fall into the hole and the remainder upon the pile of soil used for filling in about the roots. After planting, the mulching material is to be drawn about the trees, covering a space of from three to four feet in diameter.

Trees planted in the manner described will make a vigorous growth at once, and will be more hardy and live longer than those planted in cultivated land; while the cost of land and its preparation for planting will be far less than if the land were smooth and cultivated.

Until the trees are large enough to bear the land should be devoted wholly to their growth, and after they begin to produce fruit more plant food must be applied in some form, and animals must be turned in, to assist in the destruction of injurious insects that develop in and feed upon the fruit. For the destruction of the codling-moth, apple-maggot, and curculio, sheep, swine, cattle, and horses may be turned in; and if the plum is grown, poultry also must be employed to preserve the fruit from the attacks of the last-named insect.

As to the results of the above-described method of fruit growing a few examples must suffice. I find the following account of an old orchard in the "Torrington (Conn.) Register:"— "Probably the largest orchard in this town is on the Levi Hodges farm. Col. Hodges set out about a thousand apple trees, and about eight hundred of them are now large, healthy trees. Most of the orchard is on a steep hill-side, and if the apples drop they keep on rolling until they reach the bottom. The ground is very rocky and good for little else, but the exposure is a warm one, with favorable conditions for the growth of the apple. Sheep are allowed to run in the orchard, which the owner considers an element of its success. It is an off or odd year orchard, except one portion, which has worked around to bearing the even year. The crops for the past sixteen years are as follows: In 1871, the yield was 1,200 bushels; 1873, 2,500 bushels; 1875, 2,000 bushels; 1877, 600 bushels; 1879, 600 bushels; 1881, 900 bushels; 1882, 800 bushels; and the present season, 1,000 bushels."

Of the newly planted orchards I will give an example or two, as an illustration of the use of fertilizers to give the trees a start.

Last spring Hon. James J. H. Gregory, of Marblehead, the well-known seedsman, planted one hundred apple trees in turf on

the borders of an old pasture, and he now reports them all alive and as having made a good growth.

Upon a piece of very stony land that had many years ago been ploughed, but which was fast covering over with pitch pine trees and blackberry vines, were planted last spring one hundred and seventy-five small No. 2 peach trees, averaging not much over a quarter of an inch in diameter at the base. The holes dug for the trees were not over fifteen inches in diameter. At planting, a single large handful of bone and potash was thrown across the hole and upon the pile of soil. After the roots were covered with about two inches of soil another handful was scattered in, and the remainder of the soil filled in. After planting was over, about the first of June, two more small handfuls of the same fertilizer were sown upon the surface around each tree, and a line of turf about one spade wide was turned over, so that the land was cultivated for about three feet around the tree. The total cost of trees, fertilizer, and labor was just six cents per tree. Only five or six trees died, and the remainder have made an entirely satisfactory growth.

There being no mulching material near at hand, none was used; but, as the early part of the season was rather moist, they did not suffer from drought. The mulch will be applied next summer, and it is expected that in a few years there will be as fine an orchard of trees on that lot as can be found on any cultivated field of equal fertility.

Discussion.

Hon. James J. H. Gregory said that it had struck him as very reasonable that waste land could be utilized for fruit growing. The idea of Professor Maynard was a novel one, and the speaker inclined to the belief that the practical result would be of great pecuniary value to our State. A few years ago it was a question what farmers here should do with their apples; but since then the great business of evaporation has grown up. The exportation of apples has also grown to an immense business, and we can almost claim that it belongs to us by our position in the best apple producing belt; which runs through central New England. Outside of this belt there is no competition in growing apples for market, and the speaker believed that the exportation and evaporation of this fruit are destined to increase immensely. The Western apples are larger than ours, but consumers complain that when evaporated

they are insipid and have not the spirit and high flavor desired in cooking-apples, and which ours possess. It behooves us to make the most of these facts, and now, to aid in doing so, comes in the plan of utilizing waste lands. Apples from strong, rocky pasture lands are superior in quality to those grown on rich, moist soils. It is rare now to see a young orchard; farmers were discouraged, by the glutted condition of the market a few years ago, from planting them, and have neglected those previously planted; but it is time now to begin again. People do not like to give their best land to orchards, but, if they can be brought to see that waste lands may yield apples, they will plant. The speaker has acted on Professor Maynard's plan. He has planted Baldwin trees in pasture land on portions inaccessible to the plough.

O. B. Hadwen said that Professor Maynard had introduced a feature of fruit growing which most of us had not thought of. There is a very large area of land in this State, such as rocky land where rich soil has accumulated in the hollows, that is better fitted for apple growing than for anything else. Apples are not the most profitable crop on the best land, but if they can be grown on comparatively waste land when properly enriched, it will be a gain, for a barrel of apples is better than an empty barrel. The speaker was favorably impressed by Professor Maynard's idea of pruning apple trees so as to keep them well in hand. There is a doubt whether the cultivation of apples can keep pace with the foreign demand, and if anything can be done to supply it from our waste lands it should be done.

William C. Strong was not surprised at the hesitancy shown in speaking on the subject, as the view presented was new to most of those present. Most of the land of the members of the Society is smooth and rich, and they had not anticipated that waste lands were to come into competition with their long-subdued and tilled lands. The speaker had great respect for the opinions of Professor Maynard and Mr. Hadwen, and admitted that what they had said has force. Professor Maynard indicated that such places as he described are especially suited to the apple, which is similar in its nature to forest trees; and possibly standard pears may be included. But the idea of cutting away brush and digging little holes to plant fruit trees sounds strange to us, yet when it comes from a gentleman of such good sense it must have weight. Still the speaker felt that the first-prize fruit would continue to come from cultivated orchards, though it might not always be of the finest quality for the table; and

growing prize fruit is a very different matter from the profitable growing of fruit for sale, which he believed could be done on rocky land. For minor fruits, such as the peach, etc., culture is essential. He was glad to hear the essayist and others speak so confidently in regard to raising fruit on waste lands. People speak of the low price of apples, but we should think of the prodigality of nature and the low price at which they can be produced. We should aim to produce fruit at the least expense.

E. W. Wood said that small fruits would hardly be included by the essayist in his plan of culture. A feeling of depression in regard to the culture of apples existed a few years ago, due largely to low prices and canker-worms. He did not think we ought now to anticipate a glut of apples; the market is practically unlimited. He was not yet prepared to believe, however, that apples can be grown in brush land. They can be planted there, but will not give good fruit without fertilizing. Farmers need not, however, take their most valuable lands for orchards. There is no question that a hill-side, and rocky at that, is best for apple trees, provided the soil is strong enough. He would not plant pear trees between apple trees; the pear is longer lived than the apple. Peaches can be grown between apple trees without any difficulty, as they are pretty sure to die out before the apple trees get large. He knew a peach orchard of three acres at Grafton, where the best crop sold for thirty-five hundred dollars, and that of the next year for about two-thirds as much. Last year the buds were all killed, and this year it is the same; but if we can get an occasional crop it is the best paying of all fruits. It is true that they need less fertilizing than other fruits. The speaker did not believe in apple trees flourishing in an old, compact soil; if one does it must be in a spot peculiarly favored otherwise.

For evaporated apples, large fruit, free from knots, is wanted. Mr. Wood doubted whether we could compete with the West in this part of the business, but in shipping we have the advantage of more highly flavored fruit, and of being nearer to the point of shipment. A barrel of apples costs as much to transport as a barrel of flour. In some localities apple trees have been eaten by canker-worms every year for thirty years so that the trees looked as if they had been burnt over. Where they prevail to such an extent they are a great nuisance; but there are persons who will guarantee to keep an orchard clear for ten cents per tree. They do it by spraying with Paris green.

Asa Clement spoke of reading in a newspaper advice to plant fruit trees in waste land; but in his vicinity such lands are of very poor quality. Professor Maynard does not mean such land as this, but strong soil that holds moisture pretty well. Thirty years ago the speaker planted apple trees in newly cleared pasture land, where in some places there was so little soil among the rocks that he had to cart it in, to get enough to set the trees in. These trees have done well. The cattle run among them until September, when they are excluded in order to save the windfall fruit. He thought well of the suggestions of the essayist. Apples can be grown without much cultivation, but if planted in waste land it must be the right kind; the light soils must be left for pines and larches. He has some trees fifteen years planted that look well; those thirty years old look as if they wanted something to help them along. He strews a little ashes and bone around his trees, which improves the pasture. If they had regular supplies of food they would go right along. Some of his trees are in heavy land, where the springs are too near the surface in some places. He advised to plant apple trees where a growth of oak or hickory or other hard wood had been cut off. He has a few Roxbury Russet trees, which are not satisfactory; the Baldwin succeeds better. He thinks that apples from young trees keep best, and that a medium-sized apple keeps better than an overgrown one. There is no difference in quality between apples from cultivated and uncultivated land. He has successfully set apple trees so large that it took three men to carry one.

Mr. Hadwen said it was well understood by every one who grows apples that they must be fed with proper fertilizers, and neither Professor Maynard nor any one else can do it without. The question is whether it is any more expensive to give nourishment to trees in grass than in ploughed ground. Professor Maynard recommends not to cut the grass around the trees, but to leave it on the ground, as crops removed from the ground exhaust it.

The speaker has an orchard planted in 1843, and ploughed and fertilized since then. The trees have grown very large, but if not pruned the fruit is not so large as in grass. Fruit ripens earlier in tilled land than in grass; the ploughed ground absorbs more heat. Some kinds, among which are the Northern Spy and Holden, will be a month later in grass than in ploughed land. Trees in grass, enriched annually, give the best fruit so far as regards quality. Prize fruit must be grown with the best cultivation, and

then somebody must pick out the specimens. There is a good opportunity for those who have suitable pasture land to try what can be done by planting it with apple trees. A tree in cultivated land may be as much neglected as it can be in pasture land.

Mr. Wood said that Mr. Hadwen was right in saying that no one can grow apple trees without feeding them. The speaker repeated his previous statement that apples and peaches can be grown with less manure than other fruits, but not in hard, compact sward, which intercepts everything that you want for the trees. Trees must have more care than is commonly given them; farmers have not been encouraged to give their trees the care they need. There is no profit in apples the off year; but the speaker believes that in fifteen or twenty years the apple will be one of the most profitable crops.

Mr. Gregory thought that acid apples would sell best, when evaporated. The Western fruit looks well, but the sharp apples will take the palm. Professor Maynard made the point that trees should be manured when set out. Apple trees will begin to bear in twelve years from planting, and the whole expense up to that time could not be more than $100 per acre. Mr. Gregory believed it would pay to grow them as food for cattle and hogs. He has sixty acres of pasture land with wild apple trees almost thick enough for an orchard, and has had men at work for weeks grafting them. Land where such trees will grow will give good apples. He is always careful to graft so high that a cow cannot reach the grafts with her horns to break them. He has often seen four feet of growth on the grafts in such trees.

Edmund Hersey said that it was his fortune or misfortune to be always trying experiments in agriculture, and he sometimes thinks that the more we experiment the less we know. He has felt a great interest in fruit growing, but is not satisfied with the results he has thus far attained. There are so many conditions to be considered that it is difficult to grasp them all. He gave an account of two orchards which he planted to ascertain whether it is best to keep apple trees in cultivation or to mulch them, as nature does. The land in which he tried this experiment consisted of half an acre of gravelly knoll, running down to richer land; another portion was a little richer. All the trees had the same care in planting; the land to be mulched was not ploughed. The result was that at first the ploughed orchard grew rapidly; the other made shoots of only a foot or a foot and a half in length.

When the cultivated orchard was ready to bear, many of the trees which had grown most rapidly were injured by bursting of the bark, and some were wholly killed; but he saved a majority of the trees. To check this excessive rapidity of growth the orchard was laid down to grass. The other orchard was heavily covered with coopers' shavings — hardwood and pine — eight or ten inches in depth, and made a pretty good growth right along. Porter trees in it give four or five barrels of apples every other year. Trees on the brow of a hill where the gravel shows, and the soil is so poor that grass will not grow there, made a good growth and gave some very good apples. He afterwards discontinued mulching; but the orchard still gives good apples. He did not wish to be understood as saying that the superiority of this orchard was due to its not being cultivated, and to the other being cultivated. The condition of the atmosphere is one point to be considered. He means to mulch again. He can use a great variety of material for mulching; red cedar boughs are one of the best materials. He would not use hay or grass, because it burns through, and he thinks trees need something cooling. His own experience taught him that two feet of common gravel over the roots of trees would start them up wonderfully; and he knew a case fifty years ago, where several apple trees, then apparently past their prime, had four feet of gravel filled around them, which renewed their vigor, and they have continued to bear good crops until now. It is good to cover the ground five or six inches deep with peat muck. He gave the results of his experiments only, — the facts but not recommendations, — and would not undertake to say what is the best way to raise trees.

Samuel Hartwell said that he has an orchard in good fruit soil, and takes a good deal of pride in the trees; and another in grass land, where the trees are not worth as much as when they were planted He knows a man in Marlborough, who had exceedingly fine apples, when they were generally poor, from land in pasture for twenty years, but he thought there were few such situations as that. He would not advocate planting apple trees in small patches in pastures, for they would be apt to be neglected. It might do to lay orchards down to grass once in fifteen or twenty years. In his best orchard he has peach trees planted between the apple trees, three peach trees to one apple tree. The peach crop is destroyed three years out of four, but it pays when he gets one.

Benjamin G. Smith expressed the opinion that apple culture in its present development is not an exact science.

Professor Maynard said that they have at the Agricultural College a peach orchard planted seventeen years ago, where many of the trees have given every indication of the yellows; yet a large part of the diseased trees are now in perfect health. The treatment was to furnish abundance of plant food, especially muriate of potash. He thinks this, in connection with good feeding, a specific remedy for the yellows. Muriate of potash tends to retard the ripening of the wood, while phosphoric acid hastens it, and hence it may be well to use ground bone in connection with the muriate of potash. He thought that by this treatment peach trees might be carried to twenty-five years of age and kept healthy.

The Committee on Discussion announced that on the next Saturday Mrs. T. L. Nelson would read a paper on "Garden Flowers."

BUSINESS MEETING.

SATURDAY, February 14, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President BENJAMIN G. SMITH in the chair.

No business being brought before the meeting, it adjourned to Saturday, February 21.

MEETING FOR DISCUSSION.

GARDEN FLOWERS.

By Mrs. T. L. NELSON, Worcester.

With the awakening of spring come the first flowers, pale and delicate, alike in native and cultivated species. Under the snow they have been waiting, and they seem to shrink from the light. As the season advances brighter colors appear. Crocuses, Scillas, Hyacinths, Crown-imperials, Tulips, Narcissuses, and many other flowering bulbs make our gardens gay. These were all planted out in the autumn, and need not enter into this discussion. Nevertheless they are an important feature in the garden, which

must necessarily be almost without flowers through the spring months unless we have spring bulbs. None that I have mentioned need be renewed or transplanted every year, except Hyacinths, which are best the first year, and gradually deteriorate. In the spring it is more pertinent to take up the subject of summer flowers, and for this reason I shall confine myself to flowers that come after spring bulbs have done blooming. Among the many flowers worthy of cultivation it is difficult to select a few of which to speak. I hope you will not think because I speak of particular kinds that I consider them the most worthy of cultivation; I mention them because I have grown them, and they are familiar to me. There was a time, and not very long ago, when we could have taken up the subject of familiar garden flowers and disposed of it in half the time we can now. Times have changed, and flowers have multiplied in number and species, until it would take half a dozen papers like this to exhaust the subject, or even to treat it fairly. Not only have we more known species, but each is divided into almost countless varieties, so that it is simply impossible to speak of more than a small portion of our cultivated flowers in the short time allotted to this subject today; therefore I will talk of some flowers that grow in my garden.

Roses have been so ably and exhaustively treated and discussed by this Society that little remains to say of them. For every variety of years ago there are hundreds now. In the old time people never thought of improving the rose. Why should they? Had not the rose been sung and praised from time immemorial? And were not the same roses good enough for them? I suppose it did not enter into the minds of our forefathers that there could be any improvement. The Damask was the rose among roses. The Centifolia, or Cabbage, as it is commonly called, the old White rose, and some other sorts were grown in all old gardens. Well do I remember the rose bushes in our home garden, laden with their wealth of fragrant blossoms, and the low red roses, which were my *beau-ideal* in childhood. These old roses are like voices of the past to aged people. Except as souvenirs, they have been superseded by an entirely new class.

Take the Lily. From a very few varieties, what an outgrowth there is! We have them from many countries. There are seedlings, hybrids, and sports. As with all flowers, collectors are on the lookout for new sorts every year. The lilies to which "Solomon in all his glory" was not to be compared were probably

Amaryllis lutea, a small yellow lily which blooms abundantly in Palestine. What would have been said if the lilies in question had been *auratum!*

The Gladiolus, not many years ago, was confined to a very small number of varieties, but now their name is legion. Not only is there increase in quantity but also improvement in quality. The flower must not only be distinct but superior, or the growers discard it.

Careful hybridization has brought and is bringing about a great many changes. In no flower is there greater change than in the Dahlia, the seed of which was introduced into Spain from Mexico in the latter part of the seventeenth century. The seed produced three distinct varieties, one semi-double and the other two single. These seedlings were called Dahlias, after a Swedish botanist named Dahl. They were distributed throughout Europe, and were the only varieties grown for some years. After a time some one experimented with seed, and finally succeeded in producing double flowers, when the single were discarded as worthless. Later it was introduced into this country, and was considered *the* flower. Then it went out of fashion, for there is fashion in flowers as well as in everything else. Within a few years the Dahlia has again come into notice. We have it in a great variety of colors, double and single, large and small. I like the single sorts best for cut flowers. Either single or double flower abundantly the first year from seed, provided the seed is sown early in the spring, and the plants are put out as soon as possible — that is, as soon as there is no danger of frosts. After the first year there is no difficulty in propagating by tubers.

Helianthus multiflorus flore pleno, the Perennial Sunflower, is not as extensively cultivated as it should be. I find quite old people know it better than younger ones, for it had been lost to cultivation until some one found it, probably in some old garden. I cannot see how any one could let it go who once had it in his garden. It is herbaceous and perfectly hardy, commencing to bloom in midsummer and blooming until severe frosts. It is a beautiful plant, growing from four to six feet in height, and producing abundantly perfectly double pure yellow flowers, about three and a half inches in diameter. Altogether it is the most showy flower for cutting and for garden decoration that I know of.

There are many hardy plants and shrubs worthy of cultivation which require no special care, and there is a growing tendency

toward hardy flowers, especially herbaceous and bulbous sorts. What is more beautiful in late summer and autumn than *Anemone Japonica?* The white variety, Honorine Jobert, is the finest. Often it grows four feet in height. Large bunches of dark green leaves are surmounted by numerous pure white, single flowers, resembling those of *Helleborus niger* (Christmas Rose). It is herbaceous and hardy, only requiring a little compost in the fall. One very acceptable feature of this plant is the fact of its thriving in partial shade, and as almost everybody has some such place which is rather hard to fill, it just supplies the want.

Early in summer we have *Pœonia tenuifolia*, with its delicately cut foliage and double flowers, the color and size of a Jacqueminot rose. This is also an herbaceous plant.

The new, hardy *Amaryllis Hallii* is very beautiful. It makes its foliage early in spring, and after maturing it dies down. Late in the summer the flower stalks spring up almost like magic, so rapid is their growth, and produce a number of pink blossoms which are unlike any other Amaryllis or Lily with which I am acquainted. I consider it a great acquisition to the list of hardy bulbs.

Euphorbia corollata is an exceedingly valuable plant. The flowers are white, quite small, in panicles, and keep a long time after being cut, making it very useful for cut flowers. It is an herbaceous plant.

The Oriental Poppy is a very showy flower, and deserves a place in the garden. It is a perennial, but is easily grown from seed, and blooms the second year. Most people like it because it makes so much show when in bloom, and after that it requires no care. It is also very hardy.

The hardy Pentstemons are useful flowers, and are well worth cultivating. They are very easily grown, and I should miss mine very much.

The Hollyhock is a great favorite. People who have grown hollyhocks in old times remember them as purely single flowers, or at most semi-double, and they look on the hollyhock of today as entirely disconnected with the old-fashioned flower of long ago. Their plants were hardy and came up year after year; ours must be protected, or the place where they were will be vacant in the spring. They must be taken up, and covered in a cold frame, or protected in such a manner as not to feel the effects of freezing and thawing. It is a good plan when you have one or two rows

to put some compost and leaves around the plants, and cover with sashes and matting, or something of the kind; or, what is easier, to plant against a fence, and a stake will keep the sashes in place without the trouble of making frames. They are grown extensively from seed. The seedlings require no protection the first year beyond a little compost around the roots. Each year brings a more varied range of color. From white to black we have almost every color and shade.

The Clematis is considered hardy; but many complain that a blight has fallen on some of their plants. In many cases they flourish in the same location for years. I have a number of varieties which get no special care beyond a little mulching in the autumn. They have been out a number of years, always come up strong in the spring, and flower profusely through the season. I think *Clematis Flammula* one of the finest climbers we have. It seems more like a jasmine than a clematis. Indeed when I first saw it, it was in a private garden, and they called it *C. jasminoides*, and under that name I tried more than two years to get it. The foliage is small and bright, unlike that of any other clematis that I know. The flowers are pure white, very delicate, covering the whole plant, and very like the jasmine in fragrance. *C. Viticella* I find very hardy; and the variety *alba* has survived two winters. *Jackmanni* and some other old varieties, as I have before said, I have no difficulty in growing; but some newer sorts which I have tried the last two or three years have come up, and suddenly withered and died. Perhaps, as some dealers say, there is a disease among them. They say they dare not recommend them as they used to do. All I can say is that they disappear, and from no apparent cause.

There is a great range in bedding plants; some are desirable for cut flowers, some only valuable for garden decoration, and some answer both purposes. Among the last named are the semi-double Geraniums, and they are so beautiful and useful we might discard the single in their favor, and gain by it.

Gladioli we must have, and any one who will may grow them. With the descriptive catalogues sent out by reliable dealers one can hardly go astray in selecting varieties, but as a rule it would be better to choose from exhibition flowers, by which one can judge better than by descriptions. A great many new varieties do not satisfy our expectations, and there are so many comparatively new ones which are really fine and reasonably cheap, that it does not

pay to invest much by way of experiment. On the other hand, some fine varieties never are cheap, because they propagate slowly, either by increase of bulbs or by bulblets. I have some that I have had several years, with little increase, and I can see by them why the price keeps about the same on some bulbs, while others just as good are comparatively cheap. An example of the latter is Eugene Scribe, which increases rapidly and never produces a poor spike. I wish there were more varieties as good, yet it is cheap and accessible to all. The seedlings originated in this country are, in my opinion, as fine in proportion to the number grown as those raised in France and England. I had some unbloomed seedlings last season from C. L. Allen & Co., of Garden City, N.Y., among which I found some spikes of rare merit. A few which they had set aside for name were superb. Also, by the courtesy of Mr. Allen, I bloomed their seedling Gen. Sheridan, a very fine scarlet, not yet on the market. I have also had seedlings from V. H. Hallock, Son, & Thorpe, which were very fine. James Vick has furnished us with some excellent varieties. I think Longfellow very fine indeed. There is no need of mentioning the fine seedlings produced by the members of this Society, as they have spoken for themselves when on exhibition. With the seedlings that are being produced in this country there will soon be no need to send abroad, if, indeed, there is now. I have purchased bulbs from home and abroad, and I find I cannot get as satisfactory results the first year from imported bulbs as from home-grown. After the first year there is little difference. I never make up my mind as to the merits of an imported gladiolus the first year it blooms. Gladioli grow in almost any soil, unless it is wet and heavy, under which conditions they will not thrive or produce fine flowers. A sunny location, with light, loamy soil, partly sand, and well enriched, with plenty of water in dry times, suits them well. The bulbs must not be planted too near the surface; from three to four inches in depth, according to the size of the bulb, is about right. Remember, the new bulb or corm is made above the old bulb.

Tuberous Rooted Begonias ought to be grown in every garden. I prize them more highly than any other bedding plant, for with me they are truly bedders. They stand the rain much better than any other bedding plant that I have ever grown, from the fact that the blossoms have thick, waxy petals, and as they close when it rains, the water slips off the outside of the flower. As soon as the

rain is over the blossoms open as bright as if there had been no rain, and seem to look with surprise on their bedraggled neighbors. Last summer I bedded out about fifty varieties, amongst them *Pearcei*, which I had never seen outside the greenhouse. I never saw such fine plants of that variety. They were literally covered with the lovely blossoms, which stood well above the handsome foliage. I cannot see why this class of begonias is not more generally grown for bedding purposes, except that they are rather new. I protected mine with newspapers and cloth until the last week in October. Then I lifted them in boxes and let them ripen off. The tubers may be kept in sand during the winter, being examined once in a while to see that they do not get so dry as to wither, or so wet from any cause as to decay. In the spring they may be planted quite close together in a box of earth, where they will start without any heat. As I said before, they will stand a great deal of cold. We all remember the hard frost the latter part of last May. I trembled for my begonias, which had been planted out only a few days before. I had protected them with flower-pots from the sun in the hottest part of the day and from any change that might occur at night. Over these I put some carpeting, and they were not affected in the least by the extreme cold. I speak of my experience thus minutely to show how valuable I consider them for bedding. Another important fact is that they commence to bloom when quite small, and flower without intermission through the season.

I cannot stop to enumerate the annuals, biennials, and greenhouse plants, that help make up our gardens, nor shall I touch on shrubs, as they form a subject by themselves.

It seems as though some new plague in the way of disease, worm, or bug made its appearance every year. The last two years have been no exception. I thought last year that I had every worm or insect injurious to plant-life, known or unknown, in my garden. 1883 brought the aphis on lilies, which in many instances destroyed them entirely. Last season I determined to experiment with tobacco water. I have several beds of lilies, comprising perhaps twenty-five varieties. One bed I mulched about three inches thick with tobacco stems that had been steeped to syringe rose bushes. I threw them wet about the stalks and let them remain through the season. Although the plants were perfectly covered with the pests the previous season none came last year. The others were as bad as they could be, and I doubt

very much whether some of them will come up next spring. I brushed and syringed with cold water and tobacco water, but all to no purpose.

It is time to think of sowing seed. Annuals must be sown soon, in order to have them bloom early, for the space between seedtime and harvest is short, and we must be up and doing. Biennials if sown early will, many of them, bloom the first year, and those that do not will, by being started early, make stronger plants and be better able to withstand the winter. Truly the spring is a busy time to all growers of flowers. Dame Nature has been storing her forces, and spring flowers are only awaiting her orders to appear. The snowdrop and crocus will soon be here, and the thought of the dainty blossoms fills us with gladness and delight. Birds will not tarry long, for despite the weather they come, bringing comfort to hearts weary with waiting for winter to be over. No matter how hard the storms are after they come, winter cannot stay long, for the couriers of spring have arrived. Let us remember, as we admire the beauties of the floral kingdom, —

"God might have bade the earth bring forth
Enough for great and small,
The oak tree and the cedar tree,
Without a flower at all.
We might have had enough, enough,
For every want of ours,
For luxury, medicine, and toil,
And yet have had no flowers.

"Then wherefore, wherefore, were they made,
All dyed with rainbow light,
All fashioned with supremest grace,
Upspringing day and night: —
Springing in valleys green and low,
And on the mountains high,
And in the silent wilderness
Where no man passeth by?

"Our outward life requires them not:
Then wherefore have they birth?
To minister delight to man;
To beautify the earth;
To comfort man; — to whisper hope,
Whene'er his faith is dim;
For whoso careth for the flowers
Will care much more for him!"

Discussion.

Rev. A. B. Muzzey expressed the pleasure he felt in hearing an essay from a lady, and especially so good a paper, giving not only the result of experience in the culture of flowers but evidence of a love of nature. Ladies are peculiarly successful in cultivating flowers, and their experience is very valuable.

Mrs. Nelson said, in answer to an inquiry whether tuberous rooted begonias would stand the sun, that they will bear it better than fuchsias, but not as well as geraniums. Hers get the morning sun and a part of the mid-day sun. It is better to shade them in the afternoon.

Edward L. Beard agreed with Mr. Muzzey in his tribute to the lady members of the Society. He looked to them not only for papers at these discussions but for coöperation in all the work of the Society. He had been struck in years past with their enthusiasm and earnestness, and hoped, in coming time, for accessions to their numbers.

The extremes of our climate are such that many beautiful flowers which are grown out-doors in England cannot be grown here, but with intelligent management we can grow many that we do not now. Besides many hardy Pentstemons, natives of our own country, there are forty or fifty varieties of florists' hybrids, which, though only half-hardy, are among the most beautiful flowers in the garden. They can be grown without difficulty if lifted, and wintered in a cold frame. They are easily propagated by cuttings or by division, and he has lost very few. The Double Geum, which is one of the most beautiful perennials, but not hardy here, should have the same shelter. Mr. Beard thought he had had as much experience as any one with tuberous rooted begonias. There is no more beautiful flower for bedding, but there is a great difference in the hardiness of the varieties. The double kinds will not stand the hot summer sun. He has raised two or three hundred double seedlings. The single kinds vary in hardiness, but there are some that will stand the sun; among them are Vesuvius and Emperor. In the greenhouse tuberous rooted begonias are subject to rust, and require a great deal of air. He put them in a cold frame facing south, and most of them burned up. He concluded that it was impossible to grow them in open beds without partial shade; evergreen boughs stuck around and among them will answer this purpose. It is difficult to keep the tubers over

winter, on account of their liability to rot in midwinter; he had lost a quarter part of his. The best place to keep them is on a comparatively dry shelf in the cellar, at a temperature of about fifty-five degrees. They may be propagated by cuttings, and so perpetuated. The new varieties seem tender, like the new roses. Seedlings raised here from imported seed are hardier than the named varieties imported. They are easily raised from seed, which should be sown about the first of January, so as to be ready for planting out early in the season for summer decoration.

Mr. Beard said he should like to see the Narcissus more cultivated; there are many new and beautiful kinds. Every one should grow them. They will not do in damp soil, but want a place where the bulbs will mature in July. Another most desirable plant is the Carnation, — not the tree Carnation, but a hardier race, which, though not quite hardy, is susceptible of cold frame culture. There are from fifty to seventy-five kinds which are never seen in gardens here. Three years ago he imported thirty or forty varieties, of which he lost but few, and he has propagated from them, and in spring will plant them out; but those who plant them out and let them alone will be disappointed. They might be protected by putting a cold frame over them without lifting, but in this case the bed should be raised one or two feet. Among the best varieties are W. P. Milner, Mary Morris, Mrs. Simkins, Blush Clove, and The Governor. Cold, stagnant moisture in the ground is deleterious to them; and it is the same with *Lilium auratum* and other tender lilies, which should be planted in raised beds.

Every one who loves a garden should have a cold frame. They are ordinarily dug out about two feet in depth, and lined with plank or brick, and in winter should be banked up with leaves, and the glass should be covered with mats and shutters.

E. W. Wood was much pleased with the practical value of Mrs. Nelson's essay. Flowers will grow for those who love them, and the exhibition tables both here and at Worcester bear witness to the skill of the writer in the cultivation of flowers. He had hoped that this would prove a field-day for the ladies, who have more information in regard to the subject before the Society than most of the male members. It would be for the health of ladies to work in gardens more than they now do, and it would afford them quite as much opportunity as their dresses and room papers to cultivate their taste for colors and arrangement. The speaker referred to the methods of originating and introducing new varieties of flowers,

and said that, instead of accepting the glowing descriptions in florists' catalogues, it would be better to go to horticultural exhibitions, where one can see every week the productions of the best gardeners, with the names attached, which can be noted and selections made.

Mr. Beard said, in answer to an inquiry whether flowers can be bloomed in a cold frame in winter, that there are few that can, but there are many that will bloom in early spring. His theory of the cold frame is that it is a place for the storage of plants, to grow for winter blooming. He grows in them a succession of plants which give him greater pleasure than those in the greenhouse, including the Polyanthus, English Primrose, and Auricula, of different colors. The Polyanthus needs a cool, dry place, and must be raised from seed every year. From the end of January until summer sets in they are a mass of bloom. Pansies will bloom in a cold frame from January to June; after that they are out of place. He sows the seed in August and uncovers the frame at all seasons when it is not too cold. The *Anemone coronaria*, a very beautiful flower, may also be cultivated in the same way. He raises it from seed very successfully; he sows the seed in January and gets plants large enough to set by autumn. He has also had great success with imported tubers. He lifts these after flowering, and stores them in sand and replants in the fall. In England and the south of France it grows wild. Hepaticas also — not the hardy native species, but the double pink and double scarlet varieties — may be grown in the same way, as may also *Myosotis dissitiflora* and other varieties of Forget-me-nots. Violets do better in a cold frame than in a greenhouse, where they feel the effect of constant forcing. In cold frames they can be propagated from year to year. Mr. Robert Pratt's were the finest the speaker had ever seen; they are grown under natural conditions, in frames only, and never forced. The *Narcissus Bulbocodium*, or Hoop Petticoat Narcissus, and the white variety are very desirable for cultivation in cold frames. The Calochortus or Mariposa Lily is a most beautiful flower, of which there are fifteen or twenty species indigenous to the western coast of North America; it is said by many that it cannot be grown here, but it can be with the aid of a cold frame. They can be grown outdoors in England. There is now a great rage in England over the different species of Helleborus; within the last three or four years we have gained more knowledge of them than we ever had before. Here and in England they need the protection of cold frames, but

in Ireland they are quite hardy. The speaker has some plants of *Helleborus angustifolia*, from which he has cut flowers considerably larger than the white *Anemone Japonica*. Few could appreciate them without seeing them. The Hellebores flower about Christmas, and are known as Christmas Roses. There are many inferior varieties, of dingy colors, and not worth growing; that named is the best. Frame culture requires the maximum of light, but is not very difficult, attention to airing at all times, except on days when zero weather prevails, being most important.

Mr. Wood said that cold frames and hot-beds are two very distinct things. Only pansies and violets are grown by florists in cold frames. He believed that better bedding plants could be grown in hot-beds than in greenhouses; cuttings might be struck, and the whole stock grown in them. They may be used to great advantage, when nearly exhausted, in hardening off plants to prepare them for summer. He practises this method, and the plants grow stout and stocky.

Mr. Beard said that Mr. Wood had struck a very important point. A greenhouse-grown plant is apt to flag when planted out-doors, but a hot-bed, with a slight bottom heat, gives just what is wanted to inure it gradually to the out-door air. He would plunge tuberous rooted begonias in a nearly spent hot-bed and gradually harden them off, and other plants the same, giving abundance of air, and finally lifting the glass entirely before transplanting. This is a secret that all have not learned.

Joseph H. Woodford said that one of our best florists places portable cold frames over his Lilies-of-the-valley, and gets flowers two weeks earlier than the speaker can, though his plants are in a light, sandy soil, in full sunshine. The frames are placed over the plants about the first of March, and the frost soon comes out, and the plants begin to grow. The plants are in beds about six feet wide. The lilies-of-the-valley are the worst treated of all flowers, being put into corners and under the shade of trees, when they should have full sunshine and light, warm, rich soil. It is a great mistake to let them grow too thickly, as is generally done. They should have alternate rows, a foot wide, cut out, so as to renew the bed, and the dug spaces should be manured. The surplus plants can be given to the neighbors. They increase like strawberries, only that the runners are under ground.

On motion, it was voted that the thanks of the Society be presented to Mrs. Nelson for her interesting address.

The Committee on Discussions announced that on the next Saturday, Hon. James J. H. Gregory would read a paper on "Potash; Where Found in Nature; its Uses in Agriculture, and the Cheapest Sources of Supply."

BUSINESS MEETING.

SATURDAY, February 21, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, President MOORE in the chair.

Charles H. B. Breck, Chairman of the Committee appointed on the 3d of January to prepare a memorial of Francis Lyman Winship, reported the following: —

Whereas, It has pleased Almighty God to remove from a sphere of usefulness F. Lyman Winship, a member of the Massachusetts Horticultural Society for more than thirty years, who during that time served faithfully for ten years as Recording Secretary of the Society, and for five years as Chairman of the Committee of Arrangements, and whose influence added largely to the advancing of the interests of the Society, and the promotion of a spirit of goodwill and friendship among its members, —

Resolved, That we who were associated with him sincerely mourn his loss, and the loss sustained by the Massachusetts Horticultural Society.

Resolved, That we deeply sympathize with the family of the deceased in their great bereavement, and implore for them consolation from Him who has taken a beloved husband and father.

Resolved, That these resolutions be placed on the records of this Society, and that a copy be transmitted to the family of the deceased.

CHAS. H. B. BRECK,
W. J. UNDERWOOD,
JOHN C. HOVEY,
} *Committee.*

Mr. Breck, in presenting the resolutions, said that he could hardly find language to express his grief at the loss of a life-long friend, who was honorable in all his transactions; who gave perfect satisfaction as Chairman of the Committee of Arrangements and as Recording Secretary of the Society; and whose genial and social nature not only made him many personal friends, but led them to feel an interest in the Society.

William C. Strong said that by the death of Mr. Winship an old landmark was removed from the Society. He was a genial companion and an active and honored member of the Society, and succeeded the speaker as Recording Secretary. He was the last representative of the famous Winship nursery, having succeeded the brothers who founded it and were largely instrumental in the dissemination of fruit and ornamental trees and plants.

President Moore agreed with all that had been said by the two speakers who had preceded him. He had noticed that Mr. Winship always had a kind word for every one.

The resolutions were then unanimously adopted.

Adjourned to Saturday, February 28.

MEETING FOR DISCUSSION.

Potash in Agriculture.

At this meeting a paper was expected from Hon. James J. H. Gregory, of Marblehead, on "Potash, Where Found in Nature, its Uses in Agriculture, and the Cheapest Sources of Supply." Mr. Gregory was prevented, by an accident to a railroad train, from being present, and a call was made on the President for his views on the subject.

President Moore said that all that is needed to be supplied to plants as food is nitrogen, phosphates, and potash, in some form. Sometimes, if the first two are supplied, the crops will fail for want of potash. The soils in this State are generally deficient in potash, but feldspar soils have plenty of it. There is not much feldspar in this vicinity, but there is a good deal in some places in New Hampshire. In such places the application of potash produces little effect. Some crops, such as asparagus, cabbages, and

potatoes, require a great deal of potash. Dr. Goessmann's analysis of the ashes of the roots and tops of asparagus showed more than fifty per cent of potash. This convinced the speaker that on many soils it is not supplied in sufficient quantity to asparagus, and now he has a bed of an acre and a half on a poor soil that naturally produced a growth of pitch pine and birch, and never had a shovelful of dung. It was dressed with potash and bone, and from it were cut the bunches which received the first prize last year. This treatment will be continued until signs of failure are perceived. The cabbage family and all fruits require potash, if it is not in the soil already; but if there is plenty already it is of no use to apply more, though some cultivators, who have increased their crops by applying it, have made the great mistake of thinking to secure a further increase by applying more when there was already enough in the soil. A gentleman in Dighton applied a large quantity of wood ashes to his ground, which added nothing to his crop; but he had previously dressed it liberally with muriate of potash. Market gardeners near large cities find stable manure the cheapest source of all plant food, and they use it very freely, and find little benefit from the use of ashes or potash; for where thirty cords of stable manure are used to the acre, as is sometimes done by market gardeners, it furnishes all the potash needed. Neither bone nor potash evaporate, and they leach but little.

Major Henry Emery said that he considered potash the most essential food for all vegetables, especially potatoes; one hundred bushels of which, with the tops, furnish by analysis one hundred and seventy-nine pounds of potash and fifty-one pounds of phosphoric acid. In boiling a bushel of washed and peeled potatoes it was found that they lost thirty-two per cent of their potash and twenty per cent of their phosphoric acid, and the water in which they were boiled killed grass when poured on it. In rich lands, or when manured with dung, potatoes are often scabby, but in land newly burnt over, or when manured with potash, they never are. He strews it along his rows of potatoes, and seldom sees a puncture of the skin. Potatoes need more potash than any other crop, but corn will not kernel out at the tips of the ears if there is not sufficient potash in the soil. Potash is excellent for grass, and, whenever applied to it, brings in clover, which contains a large quantity of nitrogen. Its action in this respect has never been explained. The speaker thought that potash or any other fertilizer would leach out of a sandy, gritty soil, unless some green crop, such as

clover or buckwheat, was ploughed in, which would retain not only the potash, but the nitrogen and phosphates. He had used seventeen tons of commercial fertilizers in a year to advantage, and prefers potash in the form of muriate. When he uses stable manure he sprinkles potash over it.

William H. Hunt said that in common with most farmers away from cities he had found a deficiency of manure. He had bought a good deal of stable manure, which cost him eight dollars per cord at his farm in Concord, and at this price he considered it an expensive manure. Some years ago he began buying phosphates and other commercial fertilizers, but concluded that they paid only with exceptional crops. He then began with the elements, bone and ashes, buying a large quantity of the former at his farm, and using freely on grapes and strawberries, and was much pleased with the results. Since then he has bought from three to ten tons of bones yearly, and ashes when he could get them. He found that it did not pay to use acid to reduce bones; unlike potash, it is not valuable as a fertilizer, and the same money expended for potash would produce better results. Last year he used eighteen hundred or two thousand pounds of potash, which cost four and a half cents per pound. It comes in casks of about four hundred pounds each, and is as hard as stone. He used four or five parts of bone to one of potash. The bone, which is ground, but not very fine, is spread in the barn cellar. The potash is broken with a sledge-hammer, and dissolved to saturation in a large kettle of boiling water. It is then turned on the bone, and sets up a great heat, evolving nitrogen, to absorb which plaster is used. Kieserite (sulphate of magnesia) is a better absorbent, but costs more. It is also itself a good fertilizer for grapes. The mixture of bone and potash is allowed to stand two or three weeks, and is turned over several times, and each time covered and mixed with plaster or loam. It is considerable trouble to reduce bones in this way, but it gives a better return for the money than buying fertilizers in the market. After the heap has fermented, large pieces of bone can be crushed in the fingers. He uses no other fertilizer than this on his strawberries, and it is equally good on grapes. He has put no animal manure on his grapes since they were set out, but dressed either with ashes or bone and potash in some form, and this treatment has been so satisfactory that he will continue it. A neighbor has used a similar preparation of bone and potash on his pear trees, making the fruit better and fairer. The speaker did not

know that he had done the best thing, but he could recommend the preparation for almost any crop. He had used it in connection with hen manure on corn and other crops with excellent results. He had sometimes been cheated in buying wood ashes. In handling the potash care must be taken not to get it on the clothes or person. Muriate of potash will have no effect in reducing bones.

William C. Strong said all are agreed that potash and phosphates are useful fertilizers, but we want to know the best form. He inquired of the President whether he had used bone-black or fine ground bone undissolved.

President Moore said that he used bone-black pretty largely one year, and had also used bone in all other forms. In choosing he is governed largely by the price, and watches to see where he can get it cheapest. He can afford to apply it pretty freely, as it does not waste, but will come into use at some time. If steamed and ground fine it will last three or four years. Potash does not waste in a sandy soil, but combines with it. The best form of potash is wood ashes, if they can be got cheap and pure, such as Canada ashes with five or six pounds of potash to the bushel; but it is not easy to get them pure. Wood ashes contain phosphates as well as potash, and this is why ashes are preferable to muriate of potash, and why leached ashes are sometimes nearly as good as unleached. He reduces bone by spreading three or four bushels of ashes, and then wetting the bone and putting it on the pile, using three pounds of ashes to one of bone. It will heat and give off ammonia, and will need turning over and covering with loam, peat, or plaster. It should have a pretty thick covering, in giving which you extend the fertilizer; but this you can afford to do when you can't afford to buy it extended. In Mr. Hunt's plan the potash is more caustic, and there is more danger of wasting the ammonia. Many people are deceived in buying muriate of potash, a high grade of which contains eighty-three per cent of muriate of potash, which is equal to fifty-five per cent of pure potash.

Bone-black is bone burnt as you would burn coffee, and is used by sugar refiners for filtering sugar; after it has been used it is burnt over to get rid of the impurities, and the fine part is screened out and sold as bone-black. It is bought by manufacturers of fertilizers to dry off their mixtures, being in the form of a fine, dry powder well adapted for that purpose. There is more phosphate in bone-black than in any other bone, but the ammonia is all burnt out of it. There is less ammonia in steamed bone than in fresh,

but still a considerable quantity, — so much that it will heat in a cask.

A. W. Cheever had composted fine steamed bone with ashes as described by previous speakers. It evolved a great heat and a disagreeable smell, and he covered it with loam. He applied it to pasture land, and the grass was improved, but whether profitably or not he could not say. A dealer in chemical fertilizers told him that, if potash alone is wanted, muriate or sulphate is cheapest.

Major Emery was still of the opinion, though the President differed from him, that a very fine, sandy soil will not retain potash, but if vegetable matter is ploughed in, the soil will hold the potash. Some soils will hold whatever is put into them. He had reduced bones by placing them in a pit and putting potash over them, and covering with two feet of loam. In this way he got his bone pure. The mixture was applied to cabbages with good results. In steamed bones three per cent of the nitrogen is lost. It is true that the ashes of asparagus have a large proportion of potash, but, like all plants that grow quickly, asparagus makes very little ashes. Poplar wood ashes have a larger percentage of potash than oak wood ashes, but the slowly growing oak makes more ashes than the quickly growing poplar.

W. H. Hills said that he had tried the experiment of dissolving whole bones and succeeded, though a chemist said he could not do it. He first tried sulphuric acid, and burnt his fingers and his pocket. If a half-hogshead is used, and there is a nail driven through it, the acid will eat the nail and leak out. He recommended a wooden vat, made like those used by cider-makers, without any metal. His greatest trouble is to get wood ashes. He sometimes tempts the pedler of soap to leave his load with him, and if he set out to collect ashes, would take soap to pay for them in preference to cash. Canada ashes are good if pure. A neighbor of his gets them pure, but they come rather high, — about thirty-three cents per bushel. Dr. Nichols says that ashes will cut or saponify finely ground bones in a few hours, and that it is not necessary to spend two or three weeks, and there would be a saving in ammonia as well as in time. Some scientific men say that plaster drives off ammonia, but Dr. Nichols says it does not. The speaker uses bone and wood ashes as he does stable manure — all he can get. He thought bone and ashes should be applied in the fall, or in very early spring, to have the effect show the first year. The second crop is often benefited more than the first. It

takes some time for it to become mixed with the soil. Bone alone is of little value the first year, even when ground fine. Ashes alone do not act as soon as he used to think they did. He does not think they benefit cabbages the first year. In an experiment with ashes applied late in spring, on a square rod of grass, the product weighed half a pound less than on the adjoining square rod; but after the fall rains the effect of the ashes was seen. He doubts whether ashes affect young corn so promptly as is supposed, though they might if used in connection with hen manure. His soil is a sandy loam, not very light.

Major Emery said that in Dover ashes are much used on grass on clay soils, and the effect is seen the first year, and will last about four years.

Mr. Hills said that his father-in-law uses all the unleached ashes he can get, and has the handsomest growth of timothy he ever saw.

President Moore feared that Mr. Hills's statement in regard to the difficulty of dissolving bones in acid might be misleading. He had dissolved many tons of bones in acid and there is no trouble about it when you know how. He used an old feed-trough, putting in a hundred pounds of bones, and then mixing fifty pounds of acid with the same bulk (not weight) of water in a tub, and pouring it on the bones, and stirring it up with long-handled hoes. The greatest difficulty comes from the mixture being in a wet state. He uses plaster or dry soil to assist in drying it. If too much acid is used it is left of the consistency of melted India-rubber. He had dissolved whole bones with acid, but it is very difficult, and he advised those present not to try to dissolve any but pretty fine bone. Bone cannot be ground fine enough for plants to take up without being dissolved.

O. B. Hadwen said that, from the statements made here today, we can conclude that finely ground bone and potash are excellent food for crops. He had used many tons of each, and had never failed, when they were properly applied, to get good results. In Mr. Hills's experiment there was probably not rain enough to dissolve the potash in the ashes; crops cannot take up food until it is presented to them in solution. The most natural source of potash — wood ashes — is getting short. If near a city a farmer can avail himself to a certain extent of stable manure, but away from the city he must use commercial fertilizers, and we can sum up the matter by saying that potash and bone are the cheapest.

Mr. Hills did not want to leave the impression that he did not

approve of ashes as a fertilizer. The other fertilizers, applied at the same time with the ashes in his experiment, gave excellent results. Perhaps if he had applied the ashes earlier in the season he might have seen the result, earlier. He uses nearly all his ashes in combination with bone, believing that when so mixed and heated up both are in a better form for plant food. He has a great opinion of ashes, but would like to see the effect of his manures immediately.

President Moore suggested that there might have been sufficient potash in Mr. Hills's soil before the ashes were applied. The asparagus bed before mentioned was on a high, dry, sandy loam. The natural growth was pitch pine; this had been cut off about twenty-five years before, and the land allowed to run wild; there was not a stick on it worth saving. He applied eight hundred pounds of steamed, dried, and ground bone, and five hundred pounds of muriate of potash to the acre, early in spring. They were mixed together before applying, and no other fertilizer was used. He gets as good asparagus there as anywhere. The ground had never been cropped before the asparagus was planted. The carting of stable manure and working it into the ground would have cost nearly as much as the bone and potash used. He has a vineyard on the same soil, which is underlaid at the depth of about two and a half feet with stones as large as paving-stones, and has cobble-stones mixed through it, so that he had to use a crow-bar in digging holes for a grape trellis. The grapes planted there do not suffer from drought; the roots run down about fifteen or sixteen inches, the ground being ploughed to that depth. The cobble-stones are left for mulching. Professor Stockbridge told him that, if he were in the western part of the State, they would put him in an insane asylum if he attempted to cultivate such land.

Mr. Strong thought the statement of the President most surprising. When he saw his (the President's) vineyard on such a soil as had just been described it was a great surprise to him that it should do so well, but his surprise was still greater in regard to the asparagus, our ideas of its requirements are so different. He thought that, while the effect of bone meal is immediate, it is also more or less lasting.

President Moore thought that bone and potash are far better than stable manure for fruit of any kind. The color and flavor of fruit are affected by the fertilizers used. He believes that the color and quality of his peaches have been improved by the potash

applied. When the Garden Committee visited the peach orchard of Mr. Miles, in Concord, which was then bearing a great crop, they were surprised to find the fruit on the speaker's trees much higher colored and higher flavored. This orchard was on the same sandy soil as the asparagus bed before spoken of. Excepting that they make cultivation more difficult the stones are a benefit to the ground. They keep the soil moist, like a mulch. Professor Goessmann thinks that certain applications will affect the flavor of fruit, and is now experimenting on this point.

Mr. Hills had a small Benoni apple tree in soil so poor that it made neither wood nor fruit, to which he applied a peck of ashes in midsummer, and the next year it made a foot of growth and was overburdened with fruit. This answered the question whether his soil had not ashes enough already.

Samuel Hartwell said that he uses a ton each of ashes and bone annually on his asparagus with so good results that he will continue the practice, and might also apply them on his peach orchard.

Asa Clement said that he bought raw bones for fifty cents per hundred pounds, and broke them with a sledge-hammer, and reduced them by packing in ashes, or by dissolving in potash. He got good results, but it was too much work to break the bones in that way. He preferred to use steamed bones, which must have acid to dissolve them. He had been unable to find any place where he could get raw bones ground.

The Chairman of the Committee on Discussion remarked that, though disappointed by the non-arrival of the essayist, the meeting had been most instructive. All present knew something which they did not know when they came here. He announced for the next Saturday a paper on "The Leaf as a Study," by Dr. G. Austin Bowen.

BUSINESS MEETING.

SATURDAY, February 28, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

No business being brought before the meeting, it adjourned to Saturday, March 7.

MEETING FOR DISCUSSION.

The Leaf as a Physical Study.

By George Austin Bowen, M.D., Woodstock, Conn.

A consideration of the little things of life is often of more direct advantage and greater interest than the study of the larger and more elaborate subjects which present at once their every feature and detail, leaving nothing of note or promise to be discovered by a critical examination. In this connection the subject of today will, I trust, repay us for a closer inspection than at the first glance would be thought possible.

How utterly insignificant appears the leaf as among its myriads of fellows upon a lofty bough in summer it quivers with every breath of passing wind, — quivers and gyrates with an unending rhythmical motion, as though, impatient with its circumscribed life, it would gladly sever its connection with its parent twig and seek a position less obscure; or when, with the quickening breeze, life brightens, and it seems to frolic and laugh with its companions as they bow and flutter to its boisterous caress; or in those golden days of autumn when the air is hushed and still, as though fearful of breaking the charm that has cast its magic spell over all nature, and the view over fields and hills shows that softened hue so pleasing to the eye, and we see the leaf, now still and quiet, receive its long-anticipated freedom, and flutteringly fall in many a graceful circle to the dampened earth, to be again lost to thought and vision amid the multitude, piled many inches deep; or, again, when the searching and piercing wintry winds have routed it out from its obscurity, and with many a rude buffet sent it scurrying down the frozen street, playing with it for a moment in some sheltered corner, then carrying it high in air and toying with it an instant before carrying it away from vision, to be lost in some obscure place, there to silently moulder away and become a portion of this life-sustaining earth. So small a thing as a leaf, ruthlessly torn and strewn by the fingers of the thoughtless school-girl, or crushed beneath the tread of the dainty maiden as she saunters through the wooded by-way, unnoted because of multitude, of little interest to us because common, — this little leaf and its kindred must serve us for a theme today, and, if we study it well, we shall see that out of this infinitesimal comes a grand and glorious page of nature, resplendent with beauty, showing

plan, purpose, and design, and results therefrom stupendous in magnitude.

Let us consider the leaf in that broad view adopted by the physiologist, who looks upon it as a part of matter, having its functions to perform, and its relationship to other great creative powers of nature. The botanist must take the second position; and to him we will leave the details of classification and scientific arrangement, which, though important and absolutely necessary when we study it as scientists to unlock the secrets of nature, are unnecessary to our present purpose.

The word leaf is of Saxon origin, and means broad and flat, — just what the leaf is. It is a characteristic word of that strong and expressive language.

Before we have the leaf we have the bud, which consists of a brief cone-shaped axis with a tender growing point, bearing a protective covering of imbricated scales and incipient leaves. Within this bud the botanist will point out to us the rudimentary leaf and bud envelopes, and will classify with the greatest minuteness the various characters therein presented, and a day could be profitably spent with him in considering the vernation of the bud alone; but as physiologists we pass on.

During my lonesome drives in spring-time I have whiled away many weary hours, and shortened the miles, by noting the bud development of our native trees and shrubs. Nothing can be more satisfactory to the lover of nature than to witness this evidence of awakening vitality, for it tells him that the inclement season has passed, and that the beauties of the spring-time are at hand. The great swollen buds, with their varnished surfaces, can present to the thoughtful man a sermon of trust and immortality, more pregnant with everlasting truths than all the theological reasonings we hear from the pulpits.

The growing bud throws off its now useless scales, and we have the miniature leaf before us; tender in its fibre, delicate in its tracery of outline, and beautiful beyond the painter's art in its softened coloring. A few days of warm sunshine and balmy winds, and what a change has taken place upon the whole face of the country! Every shrub and tree is loaded with verdure; bleak woodlands are now delightful resorts, and the brown fields are transformed into seas of emerald; hundreds of thousands of tons of foliage have appeared — from whence?

The leaf is full grown, and from now till fall carries on its

peculiar functions, which present questions of intense interest to the student of nature.

Anatomically considered the leaf is a portion of the substance of the bark, expanded into a broad, thin plate by means of a woody framework, or skeleton, issuing from the inner part of the stem. This plate is called the lamina, or blade of the leaf, and consists of two parts, the framework and the parenchyma. The framework is made up from the branching vessels of the foot-stalks; which are woody tubes pervading the parenchyma, and carrying nourishment to every part. From the analogy of their functions these vessels are called veins. The parenchyma consists of two parts or strata, more or less distinct; arranged differently in different leaves according as their natural position is horizontal or vertical. Externally the leaf is covered with a layer of empty, united cells, mostly tubular, forming a superficial membrane called the epidermis, which is analogous to the cuticle that covers our own bodies. Its office in the leaf is to check evaporation. The surface of the parenchyma, immediately beneath the epidermis, is composed of one or two layers of oblong cells, placed perpendicularly to that surface, and more compact than the layer of cells beneath them, which constitutes the lower stratum, and which contains in addition, in common with the whole epidermis, the stomata, or mouths, which are little clefts through the epidermis, and are always placed over and communicate with the intercellular passages. These little openings are guarded by valves, which are supposed to regulate transpiration. The number of these mouths, or stomata, is simply astonishing. A single square inch of surface of the leaf of the common garden rhubarb contains 5,000, the garden iris 12,000, the pink 36,000, and the hydrangea 160,000. Note the immense number of them. We shall allude to this point further on. Our leaf is also provided with glands, which are cellular structures, serving to elaborate and hold the peculiar secretions of the plant, such as aromatic oils, resins, honey, poisons, etc. A gland may be merely an expanded cell at the summit or base of a hair, or it may be a peculiar cell under the epidermis, giving to the organ a punctate appearance, as in the leaf of the lemon. Other glands are compound, and are either external, as in the sundew, or internal reservoirs of secretions, as in the rind of the orange. Whatever their construction or position, they are important adjuncts to the legitimate office of the leaf.

The beautiful green of the leaf, so restful to the eye, is a waxy substance termed chlorophyl (*chloros*, green, and *phyllon*, a leaf). It is soluble in chloroform and ether, but insoluble in water, and floats in the fluid of the cells as minute granules. The light of the sun seems to be essential to its formation. Although found in vast abundance in the vegetable kingdom, hundreds of tons being everywhere about us, chemists can tell, or have told us, but very little about it. They have not yet ascertained its component elements, much less their relative proportions. They cannot tell whether it contains iron or nitrogen; they have only got so far that they can say it is never produced in the absence of compounds capable of supplying those elements. It is possible that it may contain more than one substance, or that the leaf green of all plants is not in every respect identical. Chlorophyl is found in those cells of plants where the absorption and decomposition of carbonic acid gas go on; with which characteristic process of vegetable life it is closely connected. Thus starch granules are formed in the midst of a complex material, to which the name of protoplasm is given, this formative material being dyed as it were with chlorophyl. It is then extremely probable that chlorophyl, under the sun's radiant energy, stands, in relation to carbonic acid gas which is decomposed by plants, in very much the same position of importance that hæmaglobin does to the gas of our own blood; showing that the principle called "life" in the vegetable kingdom is similar to that in the animal. Solutions of chlorophyl present a very fickle color when viewed in different positions, being either bright green, opaque red, or vermilion.

A second coloring matter is also found, common alike to fruits and flowers; as in the leaves of the red cabbage, the skin of the grape, and in that majestic queen of the garden, the dahlia. It has passed at different times under various names; but now I believe colein is the term most generally accepted, from coleus, a genus of plants in many species of which it occurs abundantly. It is generally very irregular in distribution; and might be called one of the curiosities of the leaf, as it has no important office to fulfil. The chemist is full of information regarding this principle, and gives as its percentage composition, —carbon, 57.7; hydrogen, 4.7; oxygen, 37.6; making it identical with the coloring matter of red wine and most red, blue, and purple flowers and fruits, and with the red pigment of some of the varieties of the beech; for with ammonia it becomes violet, indigo, green, and yellow. May we not

look for the cause of our brilliant autumn colors to these chemical changes? Colein is not to be confounded with that other color material of plants, the well-known madder, so long used to dye the color called Turkish red, which is a principle of the root and not the leaf, — at least it is not stored in the leaf as are the others.

These are dry facts, perhaps; but ever since my early school days I have noticed that the drier the fact the more solicitous some one appeared to be that I should learn it. It now seems to be my turn to present, or recall, a few dry facts to your minds.

Thus we have the leaf, beautiful in its design, elaborate in its construction, presenting the same general characters, whether grown on the land or in the water, and varying in size from the diminutive, almost microscopic, leaf to that of the renowned and gigantic *Victoria regia*, which, in the waters of its native Guiana, presents a surface of eight, twelve, or even fifteen feet in diameter. The attenuated leaves of the far northern forests, although excelled by the profuse unfolding of those of the tropics with their unending variety of form and coloring, and anomalies of structure and habit, give us nevertheless the same physiological conditions, which, briefly stated, are as follows, and are all included under the term aeration, or respiration, which is of the same vital importance in the vegetable world as it is in the animal: —

1. The absorption of carbonic acid ($C O_2$) from the air under the stimulating influence of the sun's light.
2. The absorption of oxygen (O) when the influence of the sun's light is obscured or removed.
3. The formation of carbonic acid by the union of the oxygen thus obtained with the free or nascent carbon already in the tissues.
4. The assimilation of carbonic acid from whatever source it may be derived, which process, under the sun's light, decomposes the carbonic acid, retaining the carbon; and
5. Eliminating the oxygen, — one of the greatest functions of the leaf.
6. The exhalation of carbonic acid when the sun's rays are obscured, or darkness prevails.
7. The reduction of the volume of sap by transpiration.

We see by this enumeration that there are two phases of respiration, seemingly directly opposed to each other, and evidently

occasioned by the light and heat of the sun. Surely we ought to derive satisfaction from the thought that, as we till our fields during the intense heat of the summer, the sunlight that exhausts us is at the same time giving us more oxygen to breathe, and is storing up food for our future sustenance in the plant we cultivate. The thought will not render the toil less fatiguing, but the consolation comes from the knowledge that we get the upper hand of nature when we harvest the crop.

To understand the full office of the leaf we must know that the sap that flows so freely in the spring is largely composed of water absorbed by the roots of the plants. This water holds in solution minute quantities of gas and mineral salts, and adds thereto on its upward way dextrine and sugar, which it dissolves out of the cells as it comes in contact with them, gaining in density as it nears the leaf. Within the leaf it parts with much of its water, having no longer a use therefor, receiving in its place carbon, and the digested juices acted upon by the chlorophyl, as it passes through the surface of the leaf; from thence, by means of the leaf-stalk, it passes into the cellular and woody tissues of the bark, and continues its downward passage, making deposits of food, first in the cells of the pith at the base of every incipient bud; then a copious store in the cambium region; giving also a good portion to the medullary rays, some to be carried outward to the cortical layer, and some inward for solidifying the wood; and lastly the richest portion is sent to the root, every branch and fibre being filled. The return sap also contains nitrogen, to a limited extent, and minute portions of mineral matter. From this nitrogen are first organized the protein substances, analogous in composition to the living tissues of animals; and cellulose, the peculiar principle of vegetable tissue, having in it the exact elements of water, $C_{12} H_{10} O_{10}$. The action of chlorophyl upon this substance develops gum, sugar, and starch, which are nutritive products common to all plants, and are stored away for future use, as fat is stored away in our own and all animal systems. As examples we have sugar stored up in the root of the beet, and in the stalks of corn, sugar-cane, and sorghum; and starch in the tubers of the potato. These substances, with cellulose, are all composed of carbon and the elements of water, often in identical proportions. Thus, cane sugar, $C_{12} H_{12} O_{12}$; grape sugar, $C_{12} H_{11} O_{11}$; gum, $C_{12} H_{10} O_{10}$; starch, $C_{12} H_{10} O_{10}$; cellulose, $C_{12} H_{10} O_{10}$. The ease with which these five general products of leaf elaboration are converted into one another, both in the growing plant and in the

chemist's laboratory, is accounted for by the similarity of their chemical conditions. Thus, starch, gum, and cellulose may reconvert by some change in the arrangement of their constituent atoms, or they may become sugar by the addition of one or two atoms of water.

Thus we have the physiological action of the leaf, presenting to the scientific mind one of the most interesting pages of nature's hand-book. It is an interesting study, not alone because curious, but because it has had no little part to perform in rendering this world habitable for man. In a brief glance at its action in this connection we recognize its relationship to our soil, which we know to consist of two parts, the mineral and the organic. The mineral is but the disintegrated and pulverized rock, containing, to be sure, many ingredients that enter into the composition of plants, such as potassa, soda, silica, and the universal lime, all more or less soluble in water. But what would our soil be if this were all? It would be but a collection of rocky hills and sandy wastes, like the great Sahara. But, mingled with the mineral matter, we find the organic matter, which consists of the remains of former tribes of plants and animals, and the products of their decomposition, carbonic acid and ammonia. But, as the earth supported vegetable life before it did animal, we see the important place given to our little leaf; year after year, century after century, age after age, has the leaf gone on elaborating the juices of plants, extracting carbon from the air and leaving, by the final decay that comes to all, its organism to the soil, making it such as we have it today, a life-supporting element, affording, in its tillage, the occupation of a large majority of civilized men.

But it is not the soil alone that has been created by the instrumentality of our hastily surveyed leaf, for we find within its depths hidden stores of coal and petroleum, enough to last for centuries to come. From whence came they? What has our perishable leaf to do with the formation of coal? It placed it there. That is, it developed the gigantic pines, ferns, and lycopodiums from which it was composed, and in doing so may have had much to do with rendering our atmosphere respirable for animals. We are indebted to M. Brongniart for a very ingenious hypothesis which he has raised upon the fact that an increased quantity of carbon may, under peculiar circumstances, be assimilated by the leaf.[1] He supposes

[1] Carpenter's Principles of Comparative Physiology.

that, at the epoch of the growth of those enormous primeval forests which supplied the material of the coal formation, the atmosphere was highly charged with carbonic acid, as well as with humidity; and that from this source the ferns, lycopodiaceæ, and coniferæ of that era were enabled to attain their gigantic proportions. He imagines that they not only thus converted into organized products an immense amount of carbonic acid which had been previously liberated by some change in the mineral world, but that by removing it from the atmosphere they prepared the earth for the residence of a higher class of animals. It is now regarded by scientists as a fixed fact that the whole vast accumulation of carbon at present in the earth was at one time a component part of the atmosphere, and recent investigations and experiments justify the assertions of M. Bronguiart. Five parts in ten thousand is the amount of carbonic acid now contained in our atmosphere, and this seems to be in general as much as plants require; but it is not at all improbable that in those early epochs a higher percentage may have existed, for we know by direct experiment that plants will thrive in an atmosphere of from five to eight per cent of carbonic acid, provided they are supplied with strong sunlight; and we know that in those regions where a larger percentage does exist plants seem to thrive with increased vigor. Thus, in the Lake Solfatara, in Italy, where carbonic acid gas escapes from the bottom with such violence as to give the appearance of ebullition, floating islands are constantly being formed, which consist of confervæ and other simple cellular plants. The celebrated springs of Gottingen, which abound in carbonic acid, are another example; for there, also, we find the surrounding vegetation of increased luxuriance; appearing earlier in spring, and continuing later in autumn. So it may be that the leaf rendered our atmosphere respirable, as well as keeps it so today, by the removal of an ingredient so destructive to animal life.

Let us analyze this a little further. What do we mean by the statement that leaf action is keeping our atmosphere respirable today?

One of the great drawbacks or hindrances to rapid investigation in any of the natural sciences is the temptation to depart from the main line of study, and to search out the side questions; because nature is so complex in her structure that we cannot search one line far without finding it linked and interlinked with those which seem to be of equal, or even greater, importance. Keeping this

in view then, we will content ourselves with the simple statement of the phenomena of animal respiration, without going at all into its interesting details. In the act of respiration the animal absorbs oxygen from the air by means of the blood cells, or disks, which, so to speak, come in contact with it as it is spread out in the tissue of the lungs. At the same time that it absorbs its oxygen it liberates large quantities of carbonic acid gas. Vegetable respiration is the reverse of this: oxygen is eliminated, and carbonic acid gas received. Thus are the two kingdoms of the organic world dependent upon each other, the plant furnishing the oxygen that the animal consumes, and the animal the carbonic acid that the plant consumes. Is there not an evidence of reasoning and design, from some source, in this arrangement?

But the question that comes most pertinently home to us today is, How are we, as farmers and horticulturists, to derive any benefit from a knowledge of leaf physiology? How are our acres to be benefited thereby? Can we insure better and larger crops? I answer, most assuredly, Yes, if we will systematically put in practice the ideas we gain from a study of our subject; not only individually, but collectively, for oftentimes if we would profit by Nature's laws we must enact state and national laws to harmonize with them.

Let us take an example of the latter point. We have all of us suffered more or less from the effects of drought, and we hear much said in connection therewith regarding the preservation of our forests. The press of the country, both agricultural and general, is filled with it at times. The leading arguments seem to be that the dank, moist atmosphere of our woodlands is occasioned by the deep shade from the foliage preventing the sun's warm rays from penetrating and dispersing it by evaporation, and that the soil of woodlands is also protected from the parching effect of the sun's influence and from drying winds; consequently such soils prove to be reservoirs for water, and in time of drought will keep the streams well fed. Undoubtedly these views are correct, and forests do play important parts in lessening the injurious effects of drought; but to my mind there is a stronger reason yet why these leaf treasuries should be carefully guarded. We have seen that the surface of the leaf is abundantly supplied with mouths, or pores, for the transpiration of sap. Numerous experimenters have investigated this subject, and have placed on record many interesting facts connected therewith, which go to show that the quantity of pure

water daily transpired is immense, and that forests make a damp atmosphere for miles around, simply from this transpired matter.

According to Hales, a cabbage presenting a surface of 2,736 square inches exhaled from day to day nineteen ounces, and on some days as high as twenty-five ounces, and these days of twelve hours only; a sunflower from twenty to thirty ounces, etc., etc., long lists being given. According to Johnston, the English agricultural chemist, a field in crop to grain or grass will transpire from 3,000,000 to 5,000,000 pounds of water in its season's growth; an immense amount, we must all acknowledge. We know that a rainfall of one inch is equal to one hundred and one tons of water to the acre. At this ratio, could all this evaporated water be returned in the shape of rain, it would amount to an inch and a half or two inches. If one acre of grass can give a result as wonderful as this, what will be the effect of large tracts devoted to forestry? In this connection we cannot but admire the silent workings of Nature, as, unseen and almost undetected, she carries on these stupendous operations.

The leaves of aquatic plants perform essentially the same offices as those which have their habitat upon the land, and there is reason for the belief that they in no small degree contribute to the purification of the waters wherein they grow, and of which, in many instances, both we and our cattle drink. When our various State legislatures are called upon to pass laws regarding the purification of streams, as in time they will be, and as is now being done in Connecticut, we shall hear more and know more of the action of the leaves of aquatic plants regarding this important office.

We see carbon extracted from the air through the leaf, and stored within the living tissues of plants, — a process universal throughout the whole vegetable world. It is within our province as inquiring agriculturists to follow it still further, and learn of its action within the soil we cultivate; for it becomes incorporated with it, sooner or later, as organic matter, by the decay of vegetable growth. During the decay a portion of the matter escapes in the form of gas; the remainder undergoes a slow process of combustion, leaving the carbon as charcoal, in which form it always remains one of the most indestructible elements. The agricultural value of charcoal does not consist in the fact that it is a component of plants, but upon other offices of great importance which it performs. It makes the soil retentive of manures, because it is one of the greatest absorbents of gases known, receiving them not

alone from the decaying matter of the soil, but from the air as well. Both air and water, in their circulation through a carbonaceous soil, readily part with their fertilizing gases to this greedily absorbing agent. It also gives power to the soil to absorb moisture, because it is itself an absorbent of water. We all know with what great rapidity peaty soils, which are simply carbonaceous soils, absorb moisture, and with what evident reluctance they part with it. Decayed vegetable matter darkens the soil, rendering it warmer; for we all know that a dark surface will absorb more of the sun's rays than a light one. A dark coat is warmer to our backs than a white one, although of the same weight and texture. The decay of vegetable matter is always accompanied by the evolution of heat, — perhaps not sensible to our feelings, but the rootlets of the growing plant realize it and are quick to respond to it. Is there not food for reflection here? Is our little leaf to be despised when its changes and many influences are thus traced out? I think not, for it opens the whole theory of the application of manures, either of our barn-yard composts, or of the so-called commercial fertilizers.

Aside from its utility in agriculture, we can view carbon as a wonderful curiosity of nature, for in its universality of condition we find it varying from lampblack, with its velvety softness, to the unyielding hardness of the brilliant diamond.

The grasses of the world, over six thousand species, or nearly one-sixth of all the flowering plants, can legitimately come within the subject of our inquiry, for they are leading crops in most sections. The principal point is that a leaf, when grown, never changes its form or size, and that when quickly grown its size is far larger than when its formation is slower. The leaves of grass follow this rule; hence would we have large grass we must grow it *quickly*, producing a large leaf, valuable not alone for itself, but because it also adds to the volume of the stem.

The fruit culturist will thoughtfully consider the subject of pruning in its relation to the proportionate capacity of the leaf to the plant and the fruit, and will guard his knife accordingly.

The anatomy of all leafy structures; the physiology depending thereon, including absorption and imbibition; the circulation of nutritive fluids; respiration, exhalation, nutrition or growth, secretion, the evolution of electricity and heat, and the chemistry of leaf action, should all be familiar ground to the agriculturist, for the leaf is the most important portion of the plant, — the busi-

ness portion, so to speak, — and he who would grow his crop well must understand the relationship.

Putting aside its physiological history, and looking at it from a commercial point of view, we see grand and ever-increasing tests of its utility as supplying food or comfort to man. Beginning with our simple garden vegetables whose leaves are edible, we stray from one item to another with augmenting interest, for we find that our subject includes those leaves in vast abundance whose medicinal qualities restore our impaired functions, — tea, the solace of old women, with the leaves of thirty-two different species used as substitutes, and as many more tried and rejected; and tobacco, that vile weed so universally used to soothe the petty and perplexing cares of man. Our little leaf stores up food in the form of grain, and grain we know forms the chief food of man, besides enabling him to get rich on "corners." It furnishes dyes soft and beautiful, and offers the artist subjects for his easel. The decorator copies it to beautify the interior of our homes; the architect refers to it as the first material used in constructing dwellings; and Holy Writ assures us that it was the first article used for clothing by the first human pair in the earliest historic period. The geologist finds its impressions and petrifactions deeply buried within the ground, and infers much of earth's history therefrom; the botanist revels in its unending beauties, and lends his aid to the naturalist in solving the vexed problem of evolution; but to the physiologist alone are its gigantic labors in making this world habitable for man revealed.

Discussion.

William C. Strong thought Dr. Bowen's paper exceedingly interesting. It had been impossible for him to conceive of any means for the production of such vast quantities of carbon as are found in the form of coal, but the theory that plants formerly had the power of absorbing more carbonic acid than they do now might account for these deposits. The remarks of the essayist on this point had suggested to him whether it would be possible to produce in our plant houses an atmosphere with an excess of carbonic acid gas, as in the primeval ages, and thereby to increase the luxuriance of growth. The possibilities of vegetable growth, as seen in the tropics and sometimes in greenhouses, are extraordinary. A single eye-cutting of a grape vine has in one season made a growth of thirty-six feet.

Dr. Bowen thought it would be difficult to introduce carbonic acid gas into plant houses without shutting off ventilation. Owing to the diffusibility of gases, without which we should have layers of gases on the surface of the earth, carbonic acid gas rises from the bottom and mingles with the air. M. Brongniart's theory as to the abundance of carbonic acid gas, and the growth of primeval forests occasioned by it, has been very carefully examined. This extraordinary luxuriance is one of the greatest curiosities, physiologically considered, of plant growth.

Francis H. Appleton said that he had always looked on leaf-mould as most desirable in gardening, but he found it difficult to accumulate enough.

Dr. Bowen said, in answer to an inquiry, that few animal remains are found in coal beds. The gigantic animals appeared later, and were partially dependent on the luxuriant growth of leaves for their support. It is a question whether there were any larger animals in early ages than the whales of the present day. The gigantic lizards were scattered over a long time; there were only one or two species at any one epoch.

Henry Ross said that he had gathered all kinds of leaves, but had thought pine leaves rather injurious to plants. He uses them for covering, but finds them difficult to remove in spring.

Dr. Bowen knew no reason why pine leaves should be injurious. They would not absorb the sun's rays as much, and they do not contain as much fertilizing material as those of deciduous trees, and hence there might be some difference in two beds covered with these two kinds of leaves. Pine leaves contain a gum which is difficult to dissolve, and therefore are longer in decomposing. They make good bedding, though they have not much absorbent property. All leaves contain crystals of oxalate of lime, which has a little fertilizing value.

Mr. Strong remarked that few plants grow under pine trees.

Dr. Bowen thought this was owing to the thick mulch formed by the pine leaves, and the dense shade, rather than to any injurious substances in the leaves.

A. W. Cheever said that he had used pine needles as a covering for strawberries, and considered it the best he had ever tried. They keep down weeds. He had ploughed them in when he planted corn and other crops with no injurious effect.

Benjamin G. Smith said that one of the best gardeners in the Society recommended pine leaves as a mulch for strawberries.

Dr. Bowen said, in answer to an inquiry, that oak leaves are long in decaying, and partially decayed leaves have the power of holding moisture.

The subject for the next week was announced as the "Propagation of Trees from Seeds," to be opened with a paper by Jackson Dawson, gardener at the Arnold Arboretum.

BUSINESS MEETING.

SATURDAY, March 7, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

William C. Strong moved that a Committee of five be appointed to consider and report what amendments, if any, are necessary to the Constitution and By-laws. The motion was unanimously carried, and the Chair appointed as that Committee, Mr. Strong, Edward L. Beard, E. W. Wood, C. H. B. Breck, and Samuel Hartwell.

Charles M. Hovey moved that the doors between the Library room and the office of the Treasurer and Superintendent be opened at proper times. On motion of William H. Spooner it was unanimously voted that Mr. Hovey's motion be laid on the table.

Adjourned to Saturday, March 14.

MEETING FOR DISCUSSION.

THE PROPAGATION OF TREES AND SHRUBS FROM SEED.

By JACKSON DAWSON, Jamaica Plain.

I have been asked to make a few remarks on the raising of trees and shrubs from seed. It is an old subject, and one that has been spoken and written on from time immemorial until the present day; so that I feel as if I had nothing new to tell. But we are a new generation, and, notwithstanding all that has been said upon the subject in the past, there are many among us who hardly know

anything about the life of a tree, or how long it takes a seed to germinate; and scarcely give any thought to a matter which should now attract the attention of every intelligent observer of nature who takes an interest in the forest wealth of our country. And there is no reason why every man, who has a lot of barren land, should not plant and care for a few acres of trees every year, using the kinds most suitable to the soil of his farm, and thereby securing a permanent investment for his children, as well as adding to the resources of his country. Our forests are fast disappearing, and if we keep on doing in the coming generation as we have done in the past we shall soon have a country of barren hills and treeless plains. Our watercourses will be torrents in the spring, and dry, gravelly beds the rest of the year. I might mention a few of the causes of the destruction of trees that could be prevented. *First.* The woodman, who cuts all that is of any use to him in a commercial way, and destroys all, or nearly all, that is left. *Second.* Forest fires, which are our greatest curse, in whatever way they may originate, — it may be a spark from a locomotive, a wad from the gun of some sportsman, or the smouldering fire left by some camper-out, which has been blown about by the rising wind; these often start fires that may destroy much valuable property. Many people do not think of the value of a tree, and do not care where a fire may end so long as it does not affect their interest. I have seen many acres of woodland burning, not ten miles from Boston, and no one attempted to stop it until it threatened to burn some little shed; then the whole community turned out to stop it, but as long as it kept in the woods they did not care. This matter should be looked into, and strict laws be made, which would protect all who might plant trees or forests; for they are one of the greatest sources of national wealth and comfort. I might say that there is scarcely a business that can be successfully carried on without the use of forest trees or their productions.

But I am getting away from my subject. The raising of trees from seed is the natural way of propagating them. Nature shows us that, and employs many agents to carry out her designs. In the first place, seeds drop from the trees to the ground and are covered by the falling leaves, or by the grass and weeds, which keep them from the drying winds until they germinate. They are scattered by the winds, and many fall in the crevices of rocks, and on good ground, or other favorable situations; they are floated down rivers and brooks and are left in the rich mud along the banks. They

are carried many miles from their original station by the birds; and the larger seeds, such as acorns and nuts, are carried away by squirrels, mice, and other animals; and buried for future use as food, and a great many of these germinate. I think that for many rows of fine oaks and hickories along the boundary walls of old farms we are indebted to the planting of the squirrels. While we can learn much from nature, we can also improve upon her methods, and supply ourselves with trees in a more economical way. It is true, if nature is left to herself, and men stop destroying, she will soon cover up the ruins made by man, for she sows with a liberal hand; but there are so many enemies at work, and so many conditions to take into consideration, that only a small percentage of the seed that drops to the ground germinates; possibly not one in a thousand comes to maturity. For this reason we cannot afford to raise our forests as nature shows us.

The sowing of tree seed where the trees are to remain is poor economy, and should not be undertaken except where it is impossible to plant; such sowing should be the exception, not the rule. A much greater quantity of seed is required; it necessitates more labor; more spots have to be replanted, and it is not generally satisfactory in its results. The soil and situation are so varied that the seed cannot be properly cared for, as it can be in the compact form of frames, seed beds, or nursery rows, where they can be protected from insects or inclement weather.

The first consideration in seed-sowing is to determine what you want to plant; the second, to procure your seed as fresh as possible; the third, to prepare a suitable soil and situation to plant them in; the fourth, to know what depth to cover them and how long to wait for the seed to come up. It would be impossible for me at this time to go through the whole list of trees and shrubs that would stand the climate of New England; therefore I will confine myself to those that are most useful. Except in a few cases given for the sake of illustration, those named in the following list are all hardy in the vicinity of Boston, and are representatives of most of the families of trees that will stand our climate: —

Acer rubrum,	Red Maple,
" *saccharinum*,	Sugar "
" *dasycarpum*,	White "
" *platanoides*,	Norway "
Æsculus Hippocastanum,	Horse Chestnut,

Ailanthus glandulosa,	Tree of Heaven,
Alnus glutinosa,	European Alder,
Amelanchier Canadensis and varieties,	Shad-bush,
Betula papyracea,	Paper Birch,
" *lenta*,	Black or Cherry Birch,
" *nigra*,	Red or River "
" *alba*,	English White "
Carpinus Caroliniana,	Hornbeam,
Carya alba,	Shell-bark Hickory,
" *sulcata*,	Western Shell-bark Hickory,
" *porcina*,	Pig-nut,
" *amara*,	Bitter-nut.
Castanea vulgaris var. *Americana*,	American Chestnut,
Castanea pumila,	Chinquapin,
Catalpa bignonioides,	Catalpa,
" *speciosa*,	Western Catalpa,
Celtis occidentalis,	Nettle tree or Hackberry,
Cercis Canadensis,	Judas tree,
Cladrastis tinctoria,	Yellow-wood,
Cornus florida,	Flowering Dogwood,
Cratægus Crus-galli,	Cockspur Thorn,
" *tomentosa*,	Black or Pear Thorn,
Cercidiphyllum Japonicum,	
Diospyros Virginiana,	Persimmon,
Fagus ferruginea,	American Beech,
" *sylvatica*,	English "
Fraxinus Americana,	White Ash,
" *pubescens*,	Downy "
" *sambucifolia*,	Water "
" *excelsior*,	English "
Gleditschia triacanthos,	Three-thorned Acacia,
Gymnocladus Canadensis,	Kentucky Coffee tree,
Ilex opaca,	American Holly,
Juglans cinerea,	Butternut,
" *nigra*,	Black Walnut,
Kalmia latifolia,	Mountain Laurel,
Liriodendron Tulipifera,	Tulip tree,
Magnolia acuminata,	Cucumber tree,
" *cordata*,	Yellow Cucumber tree,
" *Umbrella*,	Umbrella tree,

Morus rubra,	Red Mulberry,
" *alba*,	White "
Nyssa multiflora,	Tupelo, or Sour Gum,
Ostrya Virginica,	Hop-Hornbeam,
Pirus Americana,	American Mountain Ash,
Platanus occidentalis,	Button-ball tree,
Populus balsamifera,	Balm of Gilead,
Phellodendron Amurense,	Amoor Cork tree.
Prunus serotina,	Wild Black Cherry,
Quercus alba,	White Oak,
" *bicolor*,	Swamp White Oak,
" *palustris*,	Pin Oak,
" *rubra*,	Red "
" *coccinea*,	Yellow-barked Oak,
Rhododendron maximum,	Great Laurel,
Robinia Pseudacacia,	Locust,
Salix alba,	White Willow,
Sassafras officinale,	Sassafras,
Tilia Americana,	Basswood,
" *Europæa*,	Linden,
Ulmus Americana,	White Elm,
" *racemosa*,	Corky "
" *campestris*,	English "
" *montana*,	Scotch "
Viburnum Lentago,	Wayfaring tree,
Taxus baccata var. *Canadensis*,	American Yew,
Ginkgo biloba,	Maiden-Hair tree,
Larix Europæa,	European Larch,
Juniperus Virginiana,	Red Cedar,
Thuja occidentalis,	American Arbor Vitæ,
Abies balsamea,	Balsam Fir,
" *concolor*,	Rocky Mountain Silver Fir,
" *pectinata*,	European Silver Fir,
Tsuga (*Abies*) *Canadensis*,	Hemlock,
Pseudotsuga (*Abies*) *Douglasii*,	Douglas Fir,
Picea nigra,	Black Spruce,
" *alba*,	White "
" *pungens*,	Colorado Spruce,
" *excelsa*,	Norway Spruce,
Pinus Strobus,	White Pine,
" *resinosa*,	Red "

Pinus rigida,	Pitch Pine,
" *sylvestris*,	Scotch "
" *Austriaca*,	Austrian Pine.

As you perceive, the majority of this list are American trees. I know there are many foreign trees that will do well in New England, but, without being partial, I must say I believe that with few exceptions American trees are the best in the American climate, both for use and profit; and in almost all undertakings in this country the first question is, Does it pay? Of course we have those among us who take a special delight in all that is beautiful, and gather together from all parts of the world everything in the plant line that can be grown in our climate. Such men are public benefactors, but we have too few of them; most of those who plant want to reap the benefit, either directly or indirectly, as soon as possible, and to such I say, Let us plant American trees.

Soil and Situation. — In selecting a place for the seed beds the soil for all large seeds should, if possible, be a deep, rich, mellow loam, avoiding, if possible, all thin, gravelly soils or heavy clays. The soil should be well manured with good, rotten manure, one year old, and ploughed or trenched from twelve to fifteen inches deep, and well pulverized with a harrow. All coarse stones, quitch-grass, or other rubbish, should be raked off so as to have the land in the finest condition possible. If the land is full of weeds it would be well to manure heavily and plant one year with crops that would be well cultivated; or to plough it frequently during one season, so that it may be as clean as possible when the time comes for sowing. If there is anything that tries one's patience, it is attempting to grow seedlings in a soil that is already full of weed seed. The land should be well sheltered from the north and west winds, either by a hedge or fence. If it is springy or low it should be well drained. If the seeds are to be sown in beds they should be laid out five feet wide, with an alley or pathway two and a half feet wide; this will give ample room to work the beds from both sides. The beds should be raked fine, and if to be sown broadcast they will then be ready for the seed. A great many people prefer to sow broadcast; but I think that method requires more labor and care in weeding. I prefer to sow in rows nine inches apart across the bed, — especially if there are a large number of varieties, or only a limited number of plants are wanted, — or in long nursery rows eighteen inches apart if to be worked by hand, or from two and a half

to three feet if to be cultivated by horse-power. The reason I prefer the short rows is that in beds so planted you can keep the soil well stirred between them, which you cannot well do when sown broadcast; they are also easier to shade and water, if necessary, than the long nursery rows, and in the fall they are much more easily protected.

Sowing. — The seeds should never be sown when the ground is wet, or when it is raining; the soil at the time of sowing should be neither wet nor dry, but in such condition that it can be raked without clogging. If sown when wet the soil is apt to bake hard, and a great many seeds will scarcely come through, while, on the other hand, if the soil is too dry the seed is apt to work out unless covered deeper than is desirable.

A supply of water should always be at hand ready to use during dry weather on all light-rooted plants; but for large, deep-rooted plants this is unnecessary, except in protracted droughts. It is also well to have a number of light lath screens to shelter the most delicate plants from the hot sun. Having the ground well prepared, and all else necessary, we can begin sowing as soon as we can get the seed. If in the fall, we begin with the oaks, as acorns do not long retain their vitality, out of the ground. Neither does the seed of chestnut, chinquapin, hickory, or beech. To insure good success these must all be planted, or put in boxes of earth, as soon as possible. If sown broadcast the nuts should be scattered thinly and evenly over the bed, pressed down with a light wooden roller, or the back of a spade, and covered a little more than the diameter of the seed, — which would be nearly an inch for beech, chestnut, and oak, and from one to two inches for hickory, black walnut, butternut, and horse chestnut. If the same seeds are sown in drills they should be from two to three inches deep, and from one to two inches apart in the row. If not pressed down they will need from half an inch to an inch more covering than those pressed down. Some prefer to make shallow drills with a plough and sow the nuts very thickly; this will give a great many more plants to a given space, but they will not be so strong.

The Maples, with the exception of *Acer rubrum* and *Acer dasycarpum* (these two species ripen their fruit in May and June), should be sown as soon as possible after gathering, and, whether in drills or broadcast, should not be covered more than twice their diameter. If covered too deep they sprout and rot, not having strength enough to break through a great depth of soil. If maple

seed is allowed to get thoroughly dry, and is kept so until spring, very few, if any, will come up until the second year; while, if sown as soon as gathered and subjected to a good freezing, the greater portion will come up the following spring; though a few may wait until the second year.

The Ash (Fraxinus) must also be sown as soon after gathering as possible, if wanted to come up the first year. The Carpinus (Hornbeam) and the Ostrya (Hop-Hornbeam), unless sown in the autumn, will not come up until the second year. The Nyssa (Tupelo), *Cornus florida*, *Amelanchier Canadensis* (Shad-bush), *Celtis occidentalis*, the viburnums and thorns, seldom come until the second year, although there are a few exceptions, as some varieties will come if exposed to freezing, while of others not a seed will germinate even if frozen. The plum, peach, apple, and pear never come up evenly the first year unless the seed has been frozen or kept in boxes of moist earth. A great many roses will not come up the first year, even after having been frozen, although the seed of hybrids will, if frozen for a week or two, come up in less than a month. The Tulip Tree invariably takes two years, and, as the proportion of good seed is as one to ten, it should be sown very thickly to insure even an ordinary crop. I find a good plan, which saves much time and labor, is to take some good-sized boxes, and fill with seed and fine sand in alternate layers; burying the box in a well-sheltered place and leaving it there one season, lifting out the sand in the spring and sowing the seed thickly in rows, and covering lightly.

Such seeds as those of *Cercis Canadensis*, *Gleditschia triacanthos*, *Cladrastis tinctoria*, and *Gymnocladus Canadensis*, being very hard, should have boiling water poured over them, and then stand for twenty-four hours, when they may be passed through a sieve, the mesh of which corresponds to the size of the seeds to be operated upon. All those not passing through the sieve may be considered fit for sowing, while the rest should be treated to another hot bath until they have all swollen to the required size. If sown dry they will keep coming up a few at a time for a year or two. The Ailanthus, Catalpa, Morus, Platanus, Birches, and Alders are best sown in spring, as soon as the ground is dry enough to work. The ground should be very fine, and, whether in beds, broadcast, or in drills, the seed should be very lightly covered; and if a slight screen or shade were used it would be of great benefit to the young seed-

lings until they had made the second or third rough leaf, when the shade could gradually be dispensed with.

The White and Scarlet Maple, the Elms, and *Betula nigra* ripen their seed in early summer, and should be sown in freshly prepared beds as soon as gathered. At this time of the year the weather is often quite warm and dry, therefore these summer-sown seeds should be carefully attended to as regards watering, and possibly light shade should be given. Where a large amount is planted, and no screens are at hand, birch brush laid thinly over the bed is a great help. If well taken care of they will make plants from six to twelve inches high the same season. I would say, before going further, that my rule is always to cover seed sown out of doors in any ordinary loamy earth a little more than their own diameter, and if very light and sandy nearly twice as deep, but if the soil is a clay, as lightly as possible; and it makes no difference whether broadcast or in drills. I know there are a few trees whose seed will come up if covered quite deep, but they are exceptions, not the rule.

The Magnolia should not be sown out of doors in this climate before the 20th of May, as it does not do well if sown when the ground is cold. The Holly (*Ilex opaca*) is the slowest to germinate. Treated like other seeds, a few — say one in a thousand — will come up in the first year, a few hundreds the second year, and the remainder the third year. Such has been my experience. The Black Alder takes two years.

Such seeds as those of Magnolia, Rose, Mountain Ash, Crataegus, Celastrus, Euonymus, and Viburnum, which are inclosed in a fleshy pericarp or pulp, where space is of account, and also for convenience of sowing, I macerate in water at seventy or eighty degrees for one or two weeks, when they may be washed out and sown before they are thoroughly dry. This often helps germination, and more in the magnolia than any other plant I know. If the magnolia is sown when gathered, there is an oil in the pulp that surrounds the seed, which, as soon as it begins to rot, seems to penetrate the seed and make it rancid. I have frequently noticed that of the seed of the magnolia, that was not washed clean, few germinated; the pulp, in rotting, so soured the soil that it became full of fungus, which damped off many of the young plants, necessitating their removal to fresh soil to save them; while of those washed and sown under the same circumstances all came up and grew well. Of course this may not occur in

nature, where the seed is exposed to the air and weather, or eaten by the birds and voided; but I am speaking of artificial cultivation. When magnolia seed is to be sown out of doors in New England it is best, after washing it out, to put it in pots or boxes of sand, — that is, in alternate layers of sand and seed, — and place it in a frame or cellar, where it does not freeze, until the time of sowing in May. This is a good way to keep seeds for which we may have no place prepared, or which may arrive in late fall or winter, when it is impossible to get them into the ground. Very often it is more convenient to put seeds away in this manner until spring, than to sow in the fall; but it will not answer for seeds which need frost.

When seeds are sown in the fall it is well, as soon as the ground is frozen, to cover the beds or rows with a light covering of hay, pine needles, or leaves; which will keep the ground from heaving, and the heavy spring rains from washing up the seeds. If closely looked after, the covering may be left on until the seed shows signs of germination, which, in the case of large nuts, will be in June, when it should be carefully removed; this will also save a great amount of weeding.

All seed beds and rows should be kept free from weeds and, except where sown broadcast, as soon as up the ground should be hoed or cultivated frequently; this causes the young plants to push with greater vigor, and makes them better able to withstand drought. If the weather becomes very warm and dry the beds or rows of young seedlings should be well watered once or twice a week, — not by a slight sprinkling on the surface, but by a good thorough soaking, wetting the ground six or eight inches in depth. After the 1st of September the waterings may be discontinued, to allow the plants to ripen up their growth.

At the approach of winter all young seedlings that were sown in drills will stand better if a plough is run between them throwing a furrow against the stems, so as to cover them several inches deep; this keeps the young plants from heaving with the frost, and also keeps the water and ice from settling around the young stems, which often causes great injury. Those sown broadcast should have a slight covering of hay or leaves, as soon as the ground is frozen, which is usually from the 25th of November to the 1st of December in this vicinity.

Second Year's Treatment. — About the first or second week in April the covering should be removed, the young trees carefully taken

up, and the tap roots cut well back; the cuts should be clean and smooth, so they will quickly callous and send forth plenty of young fibres, which would take some time if the cuts were not smooth. If any of the tops are crooked they should be cut back to a good strong eye; this will cause them to make a straight leader. When taking up the young trees, they should not be exposed to drying winds, or hot sun, even for a few minutes, but as soon as taken up they should be tied in bundles, and the roots well sprinkled with water, and covered with a mat, or piece of old bagging, and kept moist until they are planted. There is no doubt that a great many failures in tree planting could be traced to the drying up of the roots before planting, and it has often been a wonder to me how some trees grew at all, considering the treatment they received.

The Nursery. — Having a good piece of land well prepared, either by trenching or ploughing, mark out rows three feet apart with a spade or plough; if with a plough go twice in a furrow, which will usually make the drills deep enough for trees one year old, and, if they are to remain only one year, one foot apart will do for the larger growing kinds, and six inches for the smaller ones; if to remain a longer period a much greater distance will be required.

In transplanting trees the roots should be well spread and the soil worked well in about them, and well firmed with the feet. Our seasons for planting are often so short that we have to plant in all kinds of weather, though it is best not to plant when the ground is wet, if it can be avoided. The best time is when the soil is dry enough to crumble easily; it can then be worked among the finest roots, even if there are a great many of them, by taking hold of the tree and giving it three or four good shakes as the soil is being spread around the roots; but it is hard work to get it among the roots when it is wet and pasty. After planting, weeds should never be allowed to get a foothold in the nursery, but it should be cultivated at least once every two weeks, and all weeds cut out with a hoe between the plants. This will help the tree to withstand a long drought much better than it otherwise would, and at no great cost.

At the end of the second year almost all deciduous trees, if for forest planting, will be as large as it is profitable to plant in large quantities. If wanted for ornamental purposes they will need to be transplanted at least every two or three years, and carefully pruned

into proper shape until they have reached the desired size. If often transplanted they may be successfully removed when from fifteen to eighteen, or even twenty feet in height; though I believe that vigorous young trees, from one to three feet high, when set out where they are to remain, will make much finer specimens if soil, preparation, and care be equal.

THE CONIFERS, such as Pine, Spruce, Larch, Cedar, and Hemlock require much more attention and care to grow from seed than any other class of trees, and many of the finest kinds it is impracticable to raise out of doors in our New England climate, though the common ones with care and attention may be raised quite successfully. The ground for these seeds should be a light, rich loam, deep and well pulverized, or, if not rich, made so with a good dressing of well-decomposed manure. The beds should be laid off five feet wide, and the alleys three feet. Along both sides of the beds, at intervals of five or six feet, drive a row of small posts that will rise six or eight inches above the surface of the beds. The beds should be a few inches higher than the paths, so that water will not stand on them. The situation should be as sheltered as possible both from the mid-day sun and drying winds; the north or east side of a hedge or fence is a favorable position. The beds being all prepared and raked very fine, as soon as the weather becomes settled — say from the 10th to the 20th of May — the seed may be sown thinly, in rows six inches apart, across the beds, or broadcast, and slightly covered, — certainly not more than twice their own diameter. The sowing in rows is most convenient in working them, both in the way of keeping the beds clean and stirring the soil among the young plants. If sown broadcast they should be lightly raked in and the bed rolled with a light wooden roller. I would here say that all seeds sown during warm, dry weather are much benefited by having the ground lightly rolled over them. The sowing being completed, place on the posts before mentioned lath screens made the width of the bed, with the laths not more than an inch apart. This will screen the plants from the sun and in part protect them from the birds, which often pick up the young seedlings that are just breaking ground. If no laths are handy the seed beds can be covered with pine, hemlock, or cedar branches, quite thickly at first; but the beds must be watched carefully, and as soon as the young plants begin to appear the branches should be gradually removed, until only enough are left to slightly shade the young plants, and these should be raised some inches above

the plants. It is a good plan where pine needles are plenty to cover the seed bed thinly between the rows with them; this keeps down the weeds, saves much watering, and keeps the soil from washing or baking. If the ground is very dry at the time of sowing they will require a slight watering; otherwise they will not need it. In my experience there are few seeds that require so little water as those of conifers during germination.

The critical time with young conifers is the first three months of their existence, until they have made the crown bud; after that time there is very little danger, but until then extreme watchfulness is very necessary; a great quantity of rain or a scorching sun will often prove fatal to thousands. Stirring the soil after heavy rains, and tilting the screens as soon as the sun is gone from them, or sifting dry soil amongst the beds of over-wet seedlings, is of great benefit. After the muggy weather of August is past they will require very little care the rest of the year. At the approach of cold weather they are best protected by a slight covering between the rows, and a few pine branches or a little meadow hay spread over the tops of the young plants will keep them in good condition until spring.

The Pines, such as the Scotch, Austrian, and Red, should not stand more than one year in the seed bed without transplanting, unless sown very thinly. The White, Black, and Norway Spruces will hardly be fit to transplant until the end of the second season. The Larch makes better plants if transplanted at one year, but will stand two if thinly sown. The Silver Fir, Balsam Fir, Hemlock, and others of that section may stand in the seed bed two years, while the Arbor Vitæ should be transplanted after the first season. The seeds of the Juniperus and Taxus, of all species, do not germinate until the second year, and it is well to treat them as I have recommended for all slow-growing seeds. The Ginkgo, if fresh, will come up the first year, though I have had them lying in the ground two years. The *Pinus Cembra* and otherStone Pines will lie in the ground until the second year, though a few may come up the first.

The seeds of the Conifers, with the exception of the Silver Firs, will, if kept in a cool, dry place, retain their germinating powers for a number of years, and even under adverse circumstances. A few years ago we had some branches of *Pinus contorta* sent us, which had the cones of six years upon them. Each cone was opened separately and the seed carefully sown and labelled, and a

portion of all but one grew, and that one was only two years old, while the oldest represented the seventh year. White, Scotch, Austrian, and Pitch Pine seeds came up fairly after being kept five years, and might possibly have been several years old when received. I have found in my experience that too much moisture is fatal to the germination of old seeds, especially resinous or oily ones. If sown in soil that is barely moist, and covered with dry sphagnum, so as to prevent the escape of the little moisture in the soil, many will grow; while if treated in the ordinary way the seed will swell and then rot.

A friend of mine, who does not like too much care, has a very simple way of raising annually several thousand seedlings of the Norway Spruce, and no doubt other evergreens might be grown under similar conditions. At the back of his house he has a white pine grove, which is trimmed up ten or fifteen feet; the soil is a light, sandy loam. In this he digs several beds, rakes them fine, and early in May sows the seed, rakes it in lightly, and sprinkles the bed lightly with pine needles. If the weather is very dry he gives the bed one or two waterings; if not dry, he lets it in a great measure take care of itself. In these beds the seedlings remain two years, when he transplants them into nursery beds, where they soon make nice young plants.

The Box System. — The remarks that I have made would apply to those who wish to raise trees in large quantities, and where the loss of a few hundreds in transplanting would be of no material account. To those who might wish to plant an acre or so every year, and want no failures, I would recommend another system, which requires less space and labor, though possibly more attention, but in the end any one could transplant the most difficult trees, such as oak, hickory, or chestnut, with no loss. For want of a better name I have called it the "box system." No doubt it has often been used, but I have not heard of any one using it largely except myself. By this method every root is preserved, and not even a fibre destroyed; there are few if any large tap roots to cut off, and even if grown in the nursery afterwards they lift with finer roots than the seedlings grown in the ordinary way; and though they will not make so vigorous a growth the first year as they would in the open seed bed, at the end of the second year after transplanting they are ahead of those of the same age grown in the ordinary way; and with no failures. Nine years ago we transplanted from the seed boxes to a hill-side, in sod ground with

no preparation except to turn over the sod with a spade where each tree was to go, some hundreds of oaks one year old, and today they are fine young trees, from six to nine feet high, well formed, and much more vigorous than those grown in the nursery, which have had a great amount of care and labor bestowed upon them. I believe that if many of our early planters had used this system in growing oaks, hickories, and other hard wood trees, they would not have had so many failures to complain of.

In the first place procure a lot of common boxes, such as may be had at any grocery store; any kind of boxes will do, though a uniform size is best, as they occupy less space in a six-foot frame, when packed away, than boxes of various sizes would. I usually get those that have contained canned goods, or soap, as they are nearly equal in size, and with two cuts of a splitting-saw you have from each box three flats, from three to four inches deep, which is a good depth for any ordinary seed. With a half-inch auger bore three or four holes in the bottom of each box for drainage. This will be sufficient for large-rooted plants, while the finer seeds will require to be well drained with broken pots, coarse siftings of peat, or any coarse material that will allow the moisture to pass off readily. As soon as the seeds are ripe, in the fall, get together a good pile of compost, made as follows: two parts rotten sod, one part peat, and one of sand, and if the seeds to be sown are oak, hickory, beech, chestnut, or walnut, add a portion of good rotten manure. For such seeds as I have mentioned fill your boxes two-thirds full of the compost, and press down firmly with a board or the hand. Sow the seeds evenly and press them down in the soil, covering them from half an inch to an inch in depth, according to their size. On one corner of each box smooth off a place with a plane or knife, rub over with white lead, and write the name of the seed and the date of sowing. This takes only a few minutes, and is of much value afterwards, especially where a great variety of seeds is sown. It is much better than labelling in the ordinary way, and there is no danger of the record being lost in moving the boxes from one position to another. The finest seeds — such as maples, elms, birches, alders, and others — should be covered, according to the size of the seeds, about their own diameter. After sowing, the seeds should have a good watering with a fine rose, to settle the soil. The boxes can then be piled four or five deep in a pit, the sashes placed in it, and at the approach of cold weather they

may be covered with meadow hay, or leaves. This does not keep the boxes from freezing, but when once frozen it keeps them so until spring. If no pit is available the boxes can be piled six or seven deep in a well-sheltered spot, covering the upper boxes with a few boards, the whole to be covered with leaves or other litter. In the case of all the seeds I have mentioned as taking one or more years to germinate it is unnecessary to cover the boxes with litter; but it is well to cover with boards, so that mice or squirrels may not get at the seed; and in many cases seed that has been so frozen will often come up the first season, which otherwise would not have come until the second. As soon as the weather is settled, which is usually about the middle of April, choose a well sheltered spot, level, and handy to water. If the aspect can be an eastern or south-eastern one I like it better, as they get the early morning sun, but not the scorching sun at noonday. Place all the boxes containing the nuts, acorns, and other large seeds together, in beds of three boxes wide. This will make it very compact, and much easier to care for them than if the boxes containing seeds of the same class are scattered about. The only attention these will require is to keep them well watered and free from weeds; but for such seeds as maple, ash, Carpinus, Cratægus, elm, Cladrastis, and others of like nature, it would be well to cover the boxes with lath screens until they have made the second or third rough leaf, when they might be gradually hardened off and finally exposed fully to air and light. If a few sashes could be spread to protect all delicate growing seeds it would be of great advantage, and as soon as well up they could be treated the same as the others.

The use of lath screens on seed beds saves a great amount of labor in watering, and if the plants are neglected for an hour or so the results are not so disastrous as when the young seedlings are fully exposed to the sun. Any boxes of seeds that do not come up before the last of June will hardly appear that year, but will require to be kept moist, the same as the growing plants. I usually place all such boxes together in a shady spot and cover them to the depth of an inch or more with sphagnum, and by giving them a good watering once or twice a week they are carried safely through the summer. At the approach of cold weather they are gathered together, piled five or six deep as before, and covered for the winter. When spring comes on they will need to be treated as seed that has just been sown. For the finer seeds,

such as azalea, rhododendron, kalmia, and others, a special treatment is required, which I will speak of later.

In the fall of the first year the boxes of young trees may be gathered together and wintered in a deep pit or frame and slightly covered with meadow hay. If no frame is available, three or four inches of pine needles or leaves may be placed over the boxes, and they may then be left until spring; but on no account should the boxes be left without any protection, as the young seedlings will then suffer very much in so little depth of soil.

All seedling trees can be transplanted when very young as easily as cabbages or tomatoes if taken as good care of; and many of them are benefited by the operation. We transplant thousands of them every year with but little loss. The best time is when they are making their first or second rough leaf.

In the spring of the second year all the young seedlings should be transplanted from the seed boxes to the nursery beds, or the larger ones planted where they are to remain; and for chestnuts, hickories, and oaks I believe it is best to plant them from the seed box to the field where they are to remain. If planted in nursery beds, or rows, the treatment will be the same as I have spoken of under the head of treatment in nurseries.

The boxes I have mentioned are usually from fourteen to sixteen inches square, and will hold from 100 to 125 oaks, hickories, chestnuts, or beeches; 175 to 200 ashes or maples; 250 birches or elms; and so on according to the growth of the plants. Where a greenhouse can be used for this purpose, with frames to harden off the young seedlings, much better results can be obtained, and many of the finer seeds can be grown, which it is next to impossible to grow in large quantities out of doors.

In conclusion I would say that, while I have not mentioned every tree by itself, the general principles are the same for all; that as a rule the soil should be of the best description and sheltered; that all seeds should be covered only a little, if any, deeper than the diameter of the seed; that they should be kept clean from weeds, the watering well looked to, and the shading, in the case of the finer seeds, be carefully attended to. They should be protected the first season, and in the end will well repay all the care and attention that have been bestowed upon them; and any one owning a few acres of land, who will plant a few boxes of chestnuts, black walnuts, beech, oak, hickory, or other hard wood trees, that are usually considered so difficult to transplant, after growing them one year in the

boxes and transplanting the following spring where they are to remain, will be astonished to see how much land can be covered in a few years with healthy young growths of hard wood with very little trouble or expense. And in New England, as well as in other parts of our country, we have too many acres lying idle, which it would be more profitable to plant with trees than anything else.

Rhododendrons, Azaleas, and Kalmias. — The propagation of these from seed demands great attention and care, and cannot be successfully done out of doors, but requires a greenhouse. The best soil to grow young seedlings of this class is composed of good peat, loam, and sand, in equal parts. The sand should be fine, but sharp and clean, having no clay or iron in it. Earthen pans are best to sow the seed in, as there is less danger of fungus than with boxes; but after the first transplanting boxes may be used. Being all ready to sow, — say about the first week in January, — the pans should be well drained by filling them one-third with broken crocks, over which put a covering of sphagnum, or the coarse siftings of peat, so that the soil will not work in among the drainage; then put in about two inches of the compost mentioned above, have it well firmed, and give the pans a gentle watering with a fine rose to settle the soil. As soon as settled the seed can be sown quite thickly, but evenly, over the surface. They should then be covered with the slightest possible covering, — not more than the sixteenth of an inch, — after which put over the pans a covering of fine sphagnum, give a gentle syringing, and place in a temperature of seventy degrees. After sowing, the seed should on no account be allowed to get dry; but at the same time saturation should be avoided. The seed will usually come up in from two to three weeks, and in the meantime the pans will have to be examined occasionally to see if the seed is coming. As soon as it shows signs of germinating the coarsest of the moss should be gradually removed, and when the seed is fairly up a slight sifting of fresh soil among the young seedlings will help to strengthen them. As soon as they have made the first rough leaf they should be pricked off thickly in boxes or pans of fresh soil prepared as for the seed, carefully syringed, and kept growing in a high temperature and moist atmosphere. Such delicate seedlings as rhododendrons at this stage should never be transplanted in a shed or room where there is any draught, but always in the close, moist atmosphere they are grown in, as the

roots are so delicate that only a moment's drying makes them almost worthless. After five or six weeks the plants will have covered the surface of the ground in the boxes, when they will again need transplanting, this time half an inch apart, and to be otherwise treated the same as before, always being sure to use fresh soil and clean boxes at each transplanting. At this stage, if everything has been carefully attended to, they will grow very rapidly, and will need transplanting the third time, and, if properly cared for, they will need to be planted two inches or more apart.

This frequent transplanting in fresh soil each time keeps the plants from damping and also forms the foundation of a vigorous plant for the future. If rhododendron seedlings are left long in the seed box or pan they are apt to be attacked by a minute fungus, which will often carry off thousands in a night. The best remedy I have found to check it is, at the first signs of its appearance, to heat a shovelful of sand quite hot and sift it amongst the young seedlings, using a very fine sieve. Many would think that it would destroy the plants at this tender age, but it does not; I have tried it on almost all kinds of young seedlings, and have found it very effective in destroying the minute fungus which is such a pest among young plants. About the first of September more air and less moisture may be given, so as to harden the plants off preparatory to their removal to winter quarters, which should be a deep frame or pit in some sheltered situation. They may be put in this pit the first of October; or sooner, if you need the house for other purposes. In this pit they should have plenty of air every pleasant day, but should be covered every night to keep them from frost as long as possible. This can readily be done in most seasons up to the middle of December or the first of January by a single mat; they can then be covered with mats, or meadow hay, and will only need to be uncovered once every two weeks for an hour or so to guard against damp or excessive moisture, which will often cause a fungus even in a cold pit if kept long without air. In the spring, about the first of May, they can be transplanted into well-prepared beds of peaty soil or a light, sandy loam of good depth. If dry weather sets in they will require plenty of water, as they are not deep-rooted at this time; if water is handy I give them a good syringing every evening as soon as the sun begins to leave the bed, until the middle of August, when I withhold all moisture so that the plants may ripen well before winter sets in. If they have been well cared for they

will be from six to seven inches high at the end of the second season.

At the approach of cold weather a slight covering of leaves between the young plants, and covering the tops with pine boughs, or coarse meadow hay, to keep the sun off, will carry the plants through the winter in safety. The following spring they may be planted in the nursery, where they can remain until used. The same treatment will apply to Azaleas, Kalmias, and other Ericaceous plants, only the Azaleas grow much more rapidly than the others, and at the end of the second season such species as *mollis* and *calendulacea* will have quite a number of flower-buds on them, while the Rhododendrons will scarcely show signs of flowering until the fourth or fifth year.

Discussion.

J. H. Bowditch was much pleased with the practical character of the essay, but did not agree with Mr. Dawson in regard to the use of boxes by the average cultivator, who, the speaker thought, would prefer to plant the seed where the tree was to remain.

Mr. Dawson said that it would be advisable for amateurs to try the box plan; it would be easier than any other way, especially for deciduous trees. There is no loss whatever in transplanting from the boxes, while from the nursery a large percentage is lost.

Mr. Bowditch thought most farmers would rather open a furrow with a plough, and drop half-a-dozen nuts or acorns where they want trees, and then cover with the plough. The work would be done at once, and in the easiest possible way.

O. B. Hadwen thought Mr. Dawson's paper exceedingly practical. He has not himself given much time to planting forest trees, but has had trees from Mr. Dawson which, though very small when planted, have done well. Planting trees should be encouraged, both for practical use and for ornament. He finds the seeds of all the trees in his grounds, that are large enough to produce seed, springing up around them; and has seedlings of Nature's planting, of hickories, black walnut, several species of maples, English, Scotch, and American elms, tulip tree, several magnolias, including *Soulangeana*, pine, larch, and Norway spruce.

William C. Strong thought Mr. Dawson's paper so complete, and his rules so simple, that no one could err in following his directions. It would be a very valuable guide to young nurserymen.

He doubted, however, whether growing young seedlings would be very profitable here; they are raised very cheaply in Europe and the West, and are not in demand here. The essayist calls his method simple, but it appears difficult, as if more was required than Nature requires, yet it is not so. Nature sows the seed in the fall, covers it with leaves, and it is frozen and thawed. Nature provides lavishly of seed, and can afford to do so, for a single tree will sometimes produce millions of seeds.

The essayist had given directions how to induce seeds to vegetate the first season. The speaker, after subjecting seeds to the action of frost, had put them in a gentle hot-bed, treading the manure down well; and this not only induced many to vegetate which would not otherwise have done so, but caused a prodigious growth,— double and quadruple the size of the seedlings imported. This method induces the roots to strike down. He had witnessed Mr. Dawson's method of sowing in boxes, and he gets admirable results for his purpose, which is largely to raise stocks for grafting; it is *the* way for that. The speaker agreed with Mr. Bowditch, that planting out-doors, where the trees are to remain, is the most economical way. Mr. Dawson is very successful, but it is because it *is* Mr. Dawson who watches over the work. But Nature is a good school-master as well as Mr. Dawson. The speaker could not understand why Nature has placed oily matter around magnolia seeds, which it is necessary to wash away, but he never saw a magnolia seed vegetate with the pulp around it.

Mr. Bowditch remarked that it is very important to plant oak, beech, and chestnut seeds when fresh, and not allow them to become dry.

Col. Henry W. Wilson had been much interested in Mr. Dawson's paper, which he thought well adapted to the wants of members of the Society who desired to grow a few trees and be sure of having them genuine. Mr. Dawson's method is best; it gives the conditions of Nature. Those who grow seedlings in large quantities are often negligent, and their stock cannot always be relied on. He had been disappointed, after planting and tending trees two or three years, to find that they were not what he bought them for. *Magnolia conspicua* turned out to be *M. acuminata*. The walnut and chestnut vary greatly in size and quality, and he hoped that at some time Mr. Dawson would tell us how to have them of large size and fine quality, and the walnuts with thin shells. He would

also like to know how to graft hickories; a friend of his had succeeded once and failed forty times.

Mr. Dawson suggested that there might not have been any fraud in regard to Col. Wilson's magnolias; the *conspicua* may have been grafted on the *acuminata* and the graft broken off.

President Moore said that the paper which had been read was very interesting to him. It shows the reasons for failure in raising seedlings. It gave him great satisfaction to raise anything from seed himself, whether it paid in dollars and cents or not, and he liked to know how to do it.

Aaron D. Capen wanted people to cultivate a taste for trees, and to plant rough, rocky pastures with them. This can easily be done in autumn by taking a small iron bar and making a hole about two inches deep, and dropping in a chestnut, hickory nut, or acorn. He had seen quite a grove of chestnuts planted in this way. If a gentleman in middle life will do this he will wake up some morning astonished at the results. It can easily be done in the course of a pleasant ramble; if you take fifty nuts in your pocket twenty of them will grow, and Nature will take care of them. If you want trees for timber plant them rather thickly, but if you want them for ornament or for the nuts they should have room to spread thirty feet or more. The speaker had sent choice hickory nuts of his own raising to a friend in Georgia. Trees with only tap roots are more apt to blow over than those with spreading roots.

Mr. Dawson said, in answer to an inquiry as to the best time to plant apple and pear seed, that it must either be planted in the fall, or washed out of the pomace and packed in sand and placed in a cellar. It may be sown with a drill in the spring. If not put in sand, but allowed to get dry, only part will come up the first year. He had seen the seeds of apples and peaches planted of which none came up until the second year.

President Moore said that he had kept apple seed in boxes in sand successfully until spring.

The Committee on Discussion announced for the next Saturday a paper by Hon. Marshall P. Wilder, on the "Nomenclature of Fruits," after the reading of which Hon. James J. H. Gregory would speak of "Nitrogen in Agriculture."

BUSINESS MEETING.

SATURDAY, March 14, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

The Secretary read a letter from Mrs. Martha F. Winship, acknowledging the receipt of the resolutions passed by the Society in memory of her husband, the late Francis Lyman Winship, with the thanks of herself and her children therefor.

Adjourned to Saturday, March 21.

MEETING FOR DISCUSSION.

The following paper was read by the Secretary: —

THE NOMENCLATURE OF FRUITS.

By HON. MARSHALL P. WILDER, Dorchester.

Mr. President: — I deeply regret that my health will not permit me to be present and take part in the discussions of today. The subject of this paper has claimed my attention for many years; and as president of the first great leading pomological society in the world I felt it my duty, in conjunction with a special committee of that society, to incorporate in my last address my views on the importance of the subject. These have been communicated to the principal horticultural and pomological societies of our own and other lands, and have been accepted and approved of as a necessary reform in the nomenclature of fruits. The Massachusetts Horticultural Society has joined most heartily in this reform, and I hope will continue to progress in it.

It is surprising that this work has not been entered upon before. By some it has been considered as too aggressive; but all reforms are necessarily aggressive, and, as shown by experience, must be gradual in their progress. All agree, however, that long, superfluous, inappropriate, indelicate, ostentatious, and unmeaning titles should no more be applied to our fruits. We may not be able to correct all the errors of the past, but we may prevent the repetition of them in the future. Hundreds of varieties once known in our catalogues have become obsolete for want of good proper-

ties, and so it will be in the future; and we shall retain only such as, by their excellence and adaptation to our situation and wants, are worthy of extensive cultivation. Like the Baldwin apple, the Bartlett pear, the Concord grape, and other renowned fruits, let such varieties be dedicated to perpetual remembrance by appropriate names, so that we may hand down to future generations a system of nomenclature, pure and plain in its diction, pertinent and proper in its application, and which shall be an example, not only for fruits, but for other products of the earth.

Let us have no more Generals, Colonels, or Captains attached to the names of our fruits; let us have no more Presidents, Governors, or titled dignitaries; no more Monarchs, Kings, or Princes; no more Mammoths or Tom Thumbs; no more Nonsuches, Seek-no-furthers, Ne Plus Ultras, Hog-pens, Sheep-noses, Big Bobs, Iron Clads, Legal Tenders, Sucker States, or Stump-the-Worlds. Let us have no long, unpronounceable, irrelevant, high-flown, bombastic names to our fruits, and, if possible, let us dispense with the now confused terms of Pearmain, Pippin, Belle, Beurre, Calebasse, Doyenne, Seedling, Beauty, Favorite, and other like useless or improper titles to our fruits. The cases are very few where a single word will not form a better name for a fruit than two or more. Thus shall we establish a standard worthy of imitation by other nations, and I suggest that we ask the coöperation of all pomological and horticultural societies in this and foreign countries, in carrying out this important reform. These are the suggestions which I have before made, and which have been extensively adopted by the pomological world, and I see no reason for retracting anything I have said on this subject. This reform cannot be accomplished at once; but it has the merit of putting a stop to the improper dedication of some of the most beautiful works of nature with improper, ostentatious, irrelevant, and useless terms.

In my address to the American Pomological Society I have spoken of the importance of the establishment of short, plain, and proper rules to govern the nomenclature and description of our fruits, and our duty in regard to it; and I desire once more to urge upon this Society the importance of aiding in this good work. The American Pomological Society has taken up the work in earnest, and soon, in conjunction with this and other societies, we shall have a reform worthy of its position, age, and character. I see no reason why the principle should not be carried further than has yet been done in the Catalogue of the Pomological

Society, as, for instance, by the substitution of Lucrative for Belle Lucrative, and Nelis for Winter Nelis. Pomologists may differ as to how far it should be carried, but by comparison of views we shall come to a final agreement, and the reform, we confidently believe, will at least save us from objectionable names in the future.

Discussion.

Robert Manning said that the agitation of the subject before the Society was begun nearly forty years ago, when "Rules of Pomology" were adopted by this Society and other horticultural societies. In 1867 similar rules were adopted by the American Pomological Society. The improvement proposed by Mr. Wilder was adopted by Professor Decaisne, of the Jardin des Plantes, in his magnificent work, the "Jardin Fruitier du Muséum," commenced in 1858, but to Mr. Wilder belongs the credit of first making it practical in American pomology. Some eminent pomologists have advocated retaining well-established names, such as Rhode Island Greening, even though long, when like that they are well established and easily pronounced; and perhaps it will be found best to retain familiar names, even if so long that they would not now be applied. The principle advocated by Mr. Wilder has been applied to the nomenclature of vegetables in the publications of the Society, the Clark's No. 1, Beauty of Hebron, and Early Rose potatoes becoming Clark, Hebron, and Rose, and the speaker suggested that it be applied also to the names of garden flowers and ornamental plants, thus avoiding such names as *Ilex Aquifolium parvifolia conspicua argenteo-maryinata;* or, not to take so extreme an instance, Waterer's Holly is infinitely preferable to *Ilex Aquifolium* var. *Watereri.* On this point he commended to the attention of those interested a little tract by Dr. Masters, editor of the "London Gardeners' Chronicle," on the "Nomenclature of Garden Plants."

E. W. Wood expressed his regret that Mr. Wilder could not be present to speak of the subject under discussion, which is one of great interest to him as well as to all fruit growers. All we can do is to follow out the suggestions which he has made. It is not only important that fruits should be called by simple, sensible names, but that each should have one standard name, such as the American Pomological Society has endeavored to establish. The Baldwin apple, or Woodpecker as it was originally called, has

been known by seven different names, and the Nickajack apple — a variety widely cultivated in the Southern States — has, according to Downing, no less than thirty-six synonyms.

David W. Lothrop said that his attention was drawn to the subject by reading Mr. Wilder's address as President of the American Pomological Society, and he was a little surprised to find him so severe in the pruning of names. Names, perhaps, may well be divided into three classes : first, descriptive names, such as Moore's Early, Seaver Sweet, Hunt Russet, Roxbury Russet, or Red Astrachan ; and, in the judgment of the speaker, it would be well to retain such names though they might be composed of more than one word. Second, names given in honor of the originator or disseminator of a fruit, like Baldwin or Bartlett ; or the towns in which they were natives, as Concord Grape and Hubbardston Nonsuch. The third class comprises such names as embrace honorary titles, as Captain, General, President, Bishop, etc., or those that are vulgar, coarse, or uncouth. To all of this class the speaker objected, the former being too common, the latter degrading. Mr. Meehan, the editor of the "Gardener's Monthly," says that Washington is a better name for a pear than President Washington would be. In regard to foreign names the speaker thought we can hardly claim the right to change them, though many of those of French roses are very long and repellent. Even in our own country, societies have but little control over the names of fruits and flowers.

William C. Strong said that the majority of horticulturists are poor French scholars and pronouncers, and they find such names as Étoile de Lyon and those of many other French roses extremely difficult to write or speak. He moved that a committee be appointed to consider the subject of a reform in the nomenclature of garden plants. The motion was carried, and the chair appointed Mr. Strong, E. W. Wood, Edward L. Beard, and Robert Manning as that Committee.

The discussion of Nomenclature ceased here, and the Chairman of the Committee on Discussion announced the following paper, which was read by the author : —

Nitrogen in Agriculture.

By Hon. James J. H. Gregory, Marblehead.

What is nitrogen? The air mass surrounding the earth to a depth of nearly fifty miles is composed of about four-fifths nitrogen in combination with one-fifth oxygen gas. There are always right at hand unnumbered thousands of tons of nitrogen. But this vast store of potential wealth is unfortunately never available to the agriculturist. His chemistry has never yet mastered the problem of drawing upon atmospheric nitrogen for plant food.

He has to depend for his supply wholly on that which has been incorporated into the structures of plants or animals. His sole resource consists in the wastes of these organic structures; in the form of excrements, or of dead remains, either from land or sea. The ammoniated liquor from the gas works is waste produced from the remains of ancient forests now consumed as coal.

The same is true of animal life as of plant life. While over three-fourths of the air we breathe is nitrogen, and while it enters so largely into the composition of our bodies, it appears totally inert in respiration, and enters the system solely through the organs of nutrition and in the form of vegetable or animal substances used as foods. As the product of animal decay, in drinking-water it is sometimes prejudicial to health, causing dangerous fevers.

Combined with hydrogen, in the proportion of 82 parts to 18 of the latter, it becomes ammonia; one of the most common forms in which, from the waste of both animals and plants, nitrogen is fed to our crops. It is well to fix in the mind that in changing nitrogen to ammonia, in any manure analysis, we must add about one-fifth to the quantity given. The other most important form of nitrogen is nitric acid. This is a combination of nitrogen with oxygen; and nitrates, of which we see frequent mention in all works on manures, are a combination of nitric acid with soda, potash, and other materials, which are called bases.

It appears to be a settled conviction among men of science, as a result of many experiments, that plants cannot take up pure nitrogen directly from the air. The theory is that they are able, to a greater or less degree, to get their supply through the water that carries it in some form in solution into the soil; and also, indirectly, from the air which permeates the soil and under its influences yields up its nitrogen. Also there is nitrogen latent in the soil,

having been accumulated there, that can be set free, to serve as plant food, by the action of certain substances, such as lime and plaster.

There is a general belief among agriculturists that plants have ways of collecting nitrogen still but little known. Some extremists have gone so far as to deny any necessity for feeding nitrogen to our crops, asserting that these can of themselves collect from natural sources all they require. There is a growing belief that their power to supply themselves from natural sources is greater than they have hitherto been credited with.

It has been observed, moreover, that different kinds of plants have different capacities for taking up nitrogen. Clover is an example; for, though nitrogen enters largely into its composition, it has such a capacity to help itself to the good things that surround it that it needs very little artificial help; while wheat, though it needs but little nitrogen, is so dainty a feeder that it insists on a large artificial supply from which to pick out that little.

Where Nitrogen or Ammonia Comes From. Waste of the Fisheries.—One of the principal sources from which manufacturers of fertilizers obtain their ammonia is the fish-waste or offal which they pick up all along the coast from Maine to Florida. The chief part of this waste is from the fish known by various names in different localities, as "manhaden," "heart-heads," "moss-bunkers," and in the South as "fat-backs." These are caught in nets and boiled to secure the oil, in which they are rich, at various establishments along the coast and its bordering islands. After boiling, the water and oil are pressed out of the mass, and the residue is sometimes thrown into heaps to heat and dry; at other times it is put directly into barrels and pressed in. In this condition it is known as "pomace," or "chum." If it is to be sold as fish-guano it is spread on large platforms to dry, after which it is ground. Fish-guano is sometimes treated with acid, but whether this is done or not it is a valuable fertilizer.

As a general rule three barrels of fish before cooking make one barrel of the chum. The fertilizer manufacturer dries and grinds it, using it crude, or treating it with acid, to make the nitrogen and phosphoric acid directly available for plant food. Sometimes, when the catch is a large one (over two hundred thousand fishes are at times taken in a single haul of the net—enough to load two or three vessels of fifty tons each), and the quantity of fish is greater than the oil factories can take care of in hot weather, the

surplus is sold to the neighboring farmers at the best price that can be got.

Besides the manhaden there are numerous other fish-wastes, all rich in nitrogen and phosphate. On two occasions I have purchased cargoes of spoiled herring; in one instance nine hundred barrels, at the rate of fifty or sixty cents a barrel, which, as a barrel weighs about two hundred pounds, would be about five dollars per ton. In some instances the fish are preserved in salt, which adds one-quarter or more to the weight; in others they are fresh, with the oil in them, which does not add to their value as manure, for oil is nearly pure carbon, which is of no value for the purpose; on the contrary, it somewhat hinders their decomposition.

Occasionally, during the fall fishing, on the fishing-banks near the coast, a supply of pollock will accumulate, more than the market will take; when they can be purchased at a price that will make cheap manure. A few years ago, to help sustain the market, I left a standing order with our fishermen that I would pay twenty-five cents a hundred pounds for pollock; the result was twenty thousand pounds of fine large fish, weighing from eight to fifteen pounds each, just out of the water, hauled to my manure heap.

Not long ago vast quantities of waste were made in the heads, sound-bones, and entrails, which accumulate at fishing ports. These were for years dropped into the ocean as refuse. So immense was the waste, that at the Isles of Shoals, off the New Hampshire coast, the harbor actually became so nearly closed to navigation that the inhabitants, on two occasions, had to dredge it out. I am told that beneath some of the long wharves of Gloucester, Mass., the great fishing town of the United States, there has accumulated an almost immeasurable quantity of this bone refuse. When, a few years ago, the heads, sound-bones, and entrails became a market article, I used to buy it at $5 or $6 a cord on board the cars; a cord weighs from three and a half to four tons. It was an exceedingly cheap manure, but a very disagreeable one to handle, the smell being anything but ottar of roses; while it took a vast quantity of soil to compost it. After remaining some months, oftentimes the heads would not be fully decayed, making the mass extremely disagreeable to handle, while there could only be a rough guess made as to how much of it would become plant food the same season it was applied. Of late years the fish are for the most part cleaned before the vessels reach port,

and the waste is thrown overboard. At places along the coast, where bay-fishing is conducted on a large scale, there can be sometimes found a liver or blubber chum, it being the refuse after oil is extracted from fish-liver. If a year old it loses moisture, and consequently weight; and is therefore richer. This liver chum is a pasty, sticky substance, generally sold at a figure considerably below its value by analysis. I have bought it as low as $4.50 per ton the present season (1885); and it is rarely higher than $12, although by analysis it is worth $18.83 per ton. I would advise cutting liver refuse with sharp sand, to make it fairly fine.

Halibut chum is the refuse from the heads of halibut, which are cooked under high pressure, to extract the oil that exists in the bones. The result is to leave the bones in such a state that they can easily be crumbled. Naturally this is especially rich in phosphoric acid. It analyzes worth $19.99 per ton, and is sold at from $6 to $10.

This chum is usually engaged beforehand by dealers in fertilizers; but a wide-awake man, by looking around, can generally pick up a supply.

The waste of herring and mackerel at the fishing towns is sometimes made up into chum, being first boiled, to secure whatever oil they contain. These usually contain more or less of salt, having sometimes as high as twenty per cent, which makes them about as salt as kainite; and, like the potash-bearing mineral, they therefore need to be used with some care, lest the proportion of salt present should injure the roots of growing plants.

There is another waste of the fisheries which has come into the market of late years; I refer to the skins, bones, and fins of salted fish. These come from the fish that are stripped and sold, boxed, free of bones. It is a heavy article, and the strips come a little tangled. Fertilizer manufacturers usually monopolize this, though it can sometimes be picked up at Gloucester at from $3.75 to $15 per ton.

Dog-fish are a small species of shark, weighing from three to five pounds each, which, in the summer season, swarm along the New England coast on the inner fishing-banks, driving away most other fish. They are very easily caught, and, their muscles being very firm, are rich as manure. The great trouble in manipulating these has been due to the flesh being of such a sticky, oily nature that acid will not readily act upon it. Still, they are used very largely as a source for ammonia by one large fertilizer manufacturer in the

vicinity of Boston, who composts them with horse manure, and, I infer, lets his compost heaps remain two years before using, when the objection disappears. Being so abundant along the coast, and so cheap, costing, at wholesale, but a dollar a hundred fish, they are well worthy the attention of farmers who live along the shore; for, though it might be necessary to keep them over a year, the investment would pay an interest of some hundred per cent. The fishermen in many localities would catch them if there were a market for them. The oil from the livers averages about a cent each fish; and with one cent from the livers and another from the fish itself, quite a fair business can be done during the hot months.

Waste salt that has been once used on fish contains in it some fish-waste, such as blood, and particles of the flesh and scales of the fish; for this reason it has some value as manure, in addition to its action on crops as salt. The fish scales analyze in the vicinity of 16 per cent in ammonia, and 40 per cent in phosphate of lime; they decompose more slowly than the flesh of the fish.

Fish manure, having the same origin as Peruvian guano, has the same constituents; but not in the same proportions, for ages of decay have reduced the guano greatly in bulk, and in the same proportion have concentrated it. All forms of chum have a large proportion of water in their composition. The fish heads and backbones have as high as 66 per cent. The chum pressed by a hand press has about 50 per cent, and that from a hydraulic press about 40 per cent. The average of the whole fish, as taken from the water, is about 80 per cent. The fish-guano, made from dried fish-waste, contains, on an average, 7.8 per cent of nitrogen. In making fish-guano the waste is dried in the sun, or by waste steam, and when sufficiently dry is ground, and sold at about $33 per ton.

The shells of lobsters, of which vast quantities accumulate at canning factories, are ground up and sold as plant food. They are a complete manure, and especially rich in nitrogen; analyzing, nitrogen, 6.2, potash, 0.2, phosphoric acid, 2.3 per cent.

How to Handle Fish-Waste, and the Best Way to Feed it to the Crops. — All fish-waste used in a very crude state is very stimulating, as might be inferred from its composition, and, being purchased at a low figure, is often used by farmers with a very liberal hand. As a consequence their crops are sometimes "burned up," as the phrase is. They are apt to infer that, if they

cannot see the fish in any part of the soil of the compost heap as they pitch it over, such soil can have no richness.

Now, one of the wonderful properties of dry soil is the avidity with which it takes ammonia to itself; and it may always be safely inferred that, in a well-mixed compost heap of fish-waste, the ammonia has diffused itself through every portion, and, all being assumed to be rich plant food, it should be used accordingly. Owing to the great richness of manure made from fish in bulk it is wiser, even after composting it, to use it broadcast, rather than in the hill.

Fish chum or pomace, may be used either broadcast and harrowed in, or by first composting with poor manure, to enrich the latter. If, after being broken up fine, it is put in thin layers with the manure, it will help the development of heat, which will tend to fine it up, so that it will combine with the mass when it is pitched over. A third way is to compost it with soil, waste turf, muck, or sawdust. In whatever way composted it is always good farming to take careful note of how many barrels go into the heap, so that we may know how much of potash, ammonia, and phosphoric acid we are applying to any given crop, and govern ourselves accordingly. There are two mistakes made in applying too heavily to one in applying too sparingly.

It is surprising how penetrating is the ammonia in fish-compost. For this reason, in making a heap, the bottom layer of soil should be a foot or more in thickness. I have seen cases where, the fish being used liberally, the soil was full of ammonia for several feet below the surface. In making the compost heap, after spreading the bottom layer, which should be thicker when whole fish, or the coarser waste, is to be used, cover with waste sufficient to just hide the soil; then cover with sod or soil about six times the depth of the fish, and thus proceed, scattering raw ground plaster over each layer of fish before covering with soil, at the rate of fifty pounds of plaster to five hundred weight of fish. The chemical changes which take place through the agency of the plaster produce sulphate of ammonia and carbonate of lime. After the pile has been built to four or five feet in height, surround the entire heap (it should be on level ground) with a little embankment of fine soil. This will catch the liquid that often runs from it when the fish begins to decompose, as well as catch what may be soaked from it by heavy rains; while it will also be handy for filling up the holes

that are apt to show themselves in the top as decomposition progresses, letting out bad odors unless promptly closed.

As the presence of oil or salt tends to check decomposition, fish-waste containing much of these had better be composted with stable manure rather than soil, as the heat from the manure will promote decomposition. If decomposition is slow to start, unleached ashes, or lime and plaster, may be mixed with the mass; but be sure to cover such heaps with soil. When manure is not used, the compost heaps should be made, if possible, before warm weather closes; and, after it has lain a couple of weeks, should no heat be found by driving a bar down, and testing it, then pitch it over to let the air in, and cover the outside lightly with soil. Stable manure which has heated and become "fire-fanged," thereby losing its nitrogen, can sometimes be bought at half price, and the nitrogen can be restored by composting it with fish.

Where chum is used, after having been made fine it can be applied directly to the surface of tillage land in the fall, and harrowed in or ploughed lightly under, to be thrown up near the surface by a deeper ploughing in the spring. If left on the surface I find it is spreading a table all winter long for the crows of the country.

By applying the chum in the fall it will have the advantage of rain and frost aiding to subdivide and dissolve it. Fish-skins, for use on tillage land, had better first be composted. If to be used on sward land for grass, spread thin in the fall or very early spring.

How much Fish-Waste should be used to the Acre? — To determine this we must consider two points: First, what proportion of it will make digestible plant food the first season; and, secondly, what and how much of the phosphoric acid and ammonia found in them do the crops we propose to raise require? I think we can assume, as a general truth, that nearly all the ammonia becomes plant food the same season it is applied, while not much over one-half the phosphoric acid can be safely counted on. If we use fish-waste on the same land the second year we may assume that all the phosphoric acid is available, for by that time the half left over from last season will have decomposed.

Waste fish, particularly manhaden, are often used along the sea-coast as a top-dressing for grass. This is a great forcing process, and for a time enormous crops of hay can be grown; but eventually, and especially on light soil, the crops grow less and less, when generally a larger quantity of fish is applied, resulting in still more harm, until the soil utterly refuses to respond, bakes

hard, and becomes apparently barren. The trouble is, it has had an enormous application of ammonia and phosphoric acid, but nearly none of potash; and the result is what always will ultimately happen on any soil where one of the three requisite elements of fertilizers is left out. Such soils are dying for the want of potash. To recuperate them, apply potash or manures rich in potash, and their fertility can be restored. Soils abounding in clay will bear fish-manuring without showing injury longer than those of a gravelly character.

Other Sources supplying Nitrogen. Guano. — At the head of "fertilizers," as distinguished from barn manure, stands guano. This may be defined as rotten sea-bird dung, with remains of birds intermixed. It is found on thousands of islands; but in large quantities on only a few. Being excrement of birds that feed on fish, it would, therefore, be found to contain the same manure elements as fish remains, but that rains dissolve and wash away the ammonia, leaving behind only phosphate. A few islands, however, lying near the Peruvian coast, are rainless; as what would otherwise be the rain-bearing wind of that region loses all its moisture in passing the high dry crest of the lofty Andes. These islands yield a guano that is rich in ammonia.

There are several kinds of guano in the market, known as Rectified, Guaranteed, Standard, Lobos, Navassa, Caribbean, etc., of which the first three named are varieties of the Peruvian (sometimes also called Chincha, or Guanape, according to the locality where found), all rich in ammonia: Standard containing from nine to ten per cent.; Lobos from five to five and one-half, and Guaranteed from six to seven. Each is rich in phosphoric acid, nearly all soluble; and has from two to three per cent of potash. The Navassa and Caribbean Sea guanos are rich in insoluble phosphoric acid, but are entirely wanting in nitrogen and potash. The Standard is quoted to me, at the time of writing (February, 1885), at $63 per ton of 2,240 pounds, and the Lobos at $48. The analysis published by dealers gives to the former from nine to ten per cent of ammonia, twelve per cent of phosphoric acid, and three per cent of potash. The dealers assert there is no manipulation of guano except by adding sulphate of ammonia.

It is claimed that the nitrogen in the guano has a value over that contained in manure into which enters fish blood or meat as a supply of ammonia (hence called "organic nitrogen"); inasmuch as in the guano it is in a form ready to be taken up by plants,

while the fish blood and meat must first pass through the stage of putrefaction, during which part of the nitrogen is set free in a pure state, and being, in that condition, inert as plant food, is partly lost. This loss has been estimated to be from one-sixth to one-third the total amount of nitrogen contained in the substance. Be the reason what it may, no one fertilizer has given such universal satisfaction as guano. It is, indeed, the standard by which we almost instinctively measure the value of all other fertilizers.

Farmers, in buying, should remember the difference in quality between Lobos and the Standard, and should see that the price corresponds. I was told of an instance in central Massachusetts, where last season a person mixed a little guano with salt-cake, as the residue of the manufacture of sulphuric acid is called, and sold five hundred tons of the stuff as a fertilizer. He was prosecuted, but, being a lawyer, found some loophole in the law through which he crawled.

It is proper to state, right here, that the fertilizers now in the market into whose name the word "guano" enters, however good they may be, have not, as far as I can learn, a particle of Peruvian guano in their composition. I must also add that dealers in fertilizers assert that the amount of real Peruvian guano imported is but trivial, compared with the quantity sold as such; and that some of that imported into this country from England has been found grossly adulterated. All that we farmers can do is to buy it under a warrant that it contains given quantities of nitrogen, phosphoric acid, and potash. Dealers say that, in bringing the nitrogen up to that required for standard, sulphate of ammonia is used. Assuming this to be true, and that it was not obtained from any organic source, it would be of the same value as if obtained from the guano itself. From tests I made on grass land I found that Peruvian guano started the grass earlier than did an equal amount of sulphate of ammonia applied at the same time, side by side, on an equal area. This satisfied me that its nitrogen was not derived wholly, if at all, from waste fish or meat.

Ten years ago the New York Agricultural Society took up the matter of the adulteration of Peruvian guano, purchased eleven bags of as many dealers, and had them analyzed. The result gave values differing from $38.33 to $107.68, though each was sold at the same price per ton. In the report of the Connecticut Agricultural Station for 1881 it is stated that while Peruvian guano used formerly to contain not more than one or two per cent each o

soda, sulphuric acid, and chlorine, the sample analyzed that year contained about thirteen per cent of sulphate of soda (salt-cake), and eleven per cent of common salt.

The Chincha Islands, which, in past years, have been the great source of Peruvian guano, lie near the coast of Peru, — barren granite rocks, with great depth of water close to the shore, so that in places the largest vessels can lie alongside and be loaded from the land by a shoot entering the hold. The guano, a thoroughly rotten mass of bird-dung, in which are mixed feathers, carcasses, and eggs, was from four to a hundred feet in depth. Old salts have told me that they brought up the same material from deep bottom, on the flukes of their anchors. Had they said a substance looking the same, I could better believe them. From twelve to fifteen million tons have been taken from the Chincha Islands alone. Bat guano is sometimes extensively found in large caves in various parts of the world; but it varies greatly in quality.

In applying guano, the Standard, which is especially rich in ammonia, should be applied to those crops which are especially ammonia-loving; while the Lobos should be used on those which need phosphoric acid more than they do ammonia. The potash required beyond what the guano contains may be added in the form of muriate or sulphate of potash. The quantity of guano to be used will vary with the condition of the soil in natural strength and its richness by manuring in past years, the range being from two hundred and fifty to eight hundred pounds per acre. The manner of applying will depend somewhat on the crops to be raised; but a good general rule is to apply a part before the crop is planted, and make one or two applications at different stages of its growth. If scattered broadcast it should be harrowed in at once, to prevent the escape of ammonia. That used in drills I find it easy to mix thoroughly with the soil by dragging through the furrow the top of a stocky red cedar, to which a stone weighing eight or ten pounds has been firmly tied; or a brush broom similarly weighted answers very well. When used in the hill, farmers who employ help will need to look sharply after them; for I find very few farm hands will take the care necessary to incorporate it in the soil so thoroughly as to avoid destroying the young plants. In all handling of this powerful manure we must bear in mind the danger of its contact with young roots of the sprouting seed. I recall that a dozen years ago a foreman, who assured me that he knew all about the handling of guano, planted for me a couple of acres of

cabbages. A few days after they had broken ground I noticed the very dark color of the leaves, and, mistrusting the cause, ran my fingers under the plants, and brought up the pure guano. All that piece was replanted.

To insure, as far as possible, a thorough admixture with the soil in hill-planting I have a rule for each man, — after the guano has been scattered over an area as large as a dinner-plate, and covered shallow, — to draw his six-tined fork three times through it one way, three times through it the transverse way, and then, holding his fork perpendicularly in the middle, give it a twist around. Some advocate mixing it with two or three times its bulk of earth before applying. While this insures a thorough mixture, it adds considerably to the labor of distribution; and, since the plan of dragging the cedar-boughs in the drill has worked well, I have adopted that as a saving of time. However, when there is anything of a breeze blowing, it is wise to adopt some such method; otherwise your neighbors' fields will be apt to share the manure with yours.

Let me here say, I have found it an excellent plan, when distributing fertilizers, to take the earlier part of the day; for I find that, as a rule, the calmest portion. It is a good way in handling almost any fertilizer except guano, — a little damp soil is best for this, — to have plenty of water at hand, and pour a half-bucket now and then into the barrel you are spreading from, stirring it then with a hoe until, while dry enough to spread freely, it is too damp to blow away. If applying to the surface, always do it, if possible, just before a rain.

I sometimes use guano on onions, to hurry up the bottoming of the crops, — about two hundred pounds to the acre. Having scattered it with the hand, immediately follow with a slide-hoe, to work as much of it as possible into the soil, and to save loss of ammonia. This is an excellent fertilizer to use, in connection with barnyard manure, in the early season, to give the crops a start.

Market gardeners in the vicinity of our large cities have very little respect for phosphate and special fertilizers, but, using from ten to twelve cords of stable manure to the acre, think highly of guano at the rate of a thousand pounds, or bone at the rate of two thousand pounds, per acre as an adjunct; or, when stable manure alone is to be depended upon, they allow from twenty to thirty cords. Assuming the stable manure costs $7 a cord, the expense in the latter case is greater by from $70 to $120 than when guano is used in

conjunction with a less supply from the stable. Now it is the nitrates that start the plants of the market gardener, and these the guano contributes; while the development of nitrates in stable manure requires a degree of heat which the soil does not receive until the season is somewhat advanced. Without knowing it, gardeners are using this vast amount of barn manure to get a small stock of plant food which they might easily procure in the fertilizer market, ready made and directly available, in the form of guano, or nitrate of soda. It would be wiser to dispense with three-quarters of the heavy manuring, and use one-half the saving in purchasing nitrate of soda; the balance might go into their pockets as clear saving.

Hen Manure has by some been compared in value to guano; but I regard this as an over-estimate, though it contains three times as much nitrogen as barn manure. It is a grand principle that no more nitrogen, phosphoric acid, or potash, can be obtained from the manure of any animal than is fed to it in its food. An ordinary hen will eat about two bushels of corn a year, and the larger breeds about one-half more. From this they must take the material for about one hundred and twenty-five eggs annually, a change of feathers, keep up the animal heat, and make up the growth of the body, besides performing the various functions on which life depends. Now, subtracting what is required for these purposes, the waste element in our two bushels of corn shrinks to very small proportions. We must also take into account the fact that the droppings which we save are confined almost wholly to those made during half of the twenty-four hours. By analysis two bushels of corn contains, in nitrogen, potash, and phosphates, forty-six cents in value. From this stand-point it will be seen that the droppings of a hen for a year cannot contain nearly the value sometimes claimed for them. I estimate its value at from fifteen to twenty cents. For many years I collected hen manure at a cost of a dollar per barrel, but afterwards reduced its price to seventy-five cents, and thought it, at the latter price, a cheap manure until I tested it side by side with an equal value of guano. Moreover it is a sticky mass, difficult to handle; and it is worth any one's while to experiment, if it were only to realize the advantage in the handling of any commercial fertilizer over hen manure, even in its finest state. It is generally composted with muck or dryish soil, — three parts of muck to one of manure, — and the compost should be made as fine as possible. A rake is the best tool to do this with, if it is sticky. It should be turned over in

three or four days, and a six-tined fork is a good implement for this purpose.

Sulphate of Ammonia, Nitrate of Potash, Nitrate of Soda. — The first of these is a by-product of works where coal is used for the manufacture of gas, and is one of the principal sources supplying nitrogen. It looks like rather coarse salt, and is marketed in barrels, or larger casks, up to huge tierces weighing from a thousand to fifteen hundred pounds. It is readily soluble in water, but does not waste in the air. Nitrate of potash (saltpetre) is usually too dear a source to be available for procuring nitrogen. Nitrate of soda is found in the interior of Chili, on the surface and in the soil. It is a remarkably stimulating fertilizer. If there is much rain it will waste before plants can take it up. Mr. Lawes advises to apply it only when not more than three feet in depth of the soil will be moistened. From one hundred to two hundred pounds per acre is excellent to give grass a start in the spring; it should not be applied until the leaf has made a growth of three or four inches. In dry seasons it is better and cheaper than sulphate of ammonia, as the latter needs a degree of moisture to make plant food. Still, on the whole, the sulphate of ammonia is considered the better investment; for, *first*, it is not likely to be lost in the atmosphere; *second*, it is not too soluble; *third*, it has the power of clinging to the ingredients of the soil; clay will hold it persistently, and even pure sand, washed with water, will retain a large portion of it; and, *fourth*, its ammonia is readily changed into nitric acid by the action of the soil. Nitrate of soda, we are told, "is very liable to be adulterated with white sand or broken quartz, and with salt or the cheap potash salts. . . . The purchaser should see that it dissolves entirely in water, and does not taste distinctly of salt."

I sometimes use sulphate of ammonia to hurry along crops of onions that are rather backward, spreading two hundred pounds per acre just before they begin to bottom, and working it into the soil with a slide-hoe.

Castor-Pomace. — This is a waste product of the West, being the cake left after the oil has been pressed from castor beans. In using it care should be taken to keep it where animals cannot reach it. The men who spread it ought to walk with the wind; for, though not poisonous, it is extremely unpleasant in contact with the eyes or mouth. It is a favorite manure for tobacco. I have used car-loads of it in former years, on general crops, with good results.

Azotin, Ammonite, Tankage. — The first two of these are animal wastes which have been exposed to the vapor of naphtha to extract the grease. (Of late years glue-waste, of which in its crude state for years I used from one to two hundred cords annually, is also so treated.) The residue is dry and brittle, and rich in ammonia, and every way superior for fertilizing purposes to the same substances before treatment. These are not usually found in the retail market, but are purchased by manufacturers of fertilizers, at prices based on their percentage of nitrogen and phosphoric acid, as shown by analysis in each lot offered for sale. Job lots, of from five to ten tons, can sometimes be purchased of brokers, or from great slaughtering establishments like that of Armour & Co., of Chicago. Tankage is a waste product from the intestines and other parts; it contains more or less of bone, easily crumbled, and is not uniform in fineness.

Dried Blood is the blood of the slaughter-house with most of the moisture removed, leaving it in good mechanical condition for handling. It is very rich in nitrogen, and is largely used by the manufacturers of fertilizers. There are two grades, the light and the dark colored; the latter being kiln-dried. Sometimes, when the heat has been too great, it is partially burned, to the destruction of a portion of the ammonia. The nitrogen in blood acts very readily as plant food.

Cotton-Seed Meal had better be first fed, as the manure from it is almost as rich in fertilizing materials as was the meal before feeding; for, as I have stated elsewhere, full-grown animals take but a small percentage of the potash, phosphoric acid, or nitrogen that exists in their food; while butter takes none. Occasionally spoilt cotton-seed meal can be found in the market that is nearly as good for manure as the best of meal, and, being generally valued at about three-fifths as much, is a very cheap source of nitrogen and phosphoric acid. When spoilt in salt-water transportation it is generally in very hard lumps, which have to be ground in a mill.

One high recommendation of castor-pomace and cotton-seed meal is, that their manure elements are in condition for immediate use as plant food.

Hoof and Horn Shavings and Leather. — All of these are very rich in nitrogen; but it is not readily available in these substances, and therefore their value in the market is less than it would otherwise be. Hoof and horn shavings analyze as high as

11.81 per cent nitrogen; if steamed and then ground, the nitrogen they contain becomes, in a degree, available. When used to adulterate superphosphate, as they very rarely are, being ground up, the particles can be readily detected by the microscope. Horn-waste is mostly in thin, bulky shavings, which are marketed in huge bags. Several years ago I purchased a ton to test its availability and value, not having any idea of the peculiar mechanical condition of the article. Standing at my door one morning I saw a team coming down the street, with a bulk of bags piled as high as a large load of hay. While I was wondering what new product had come to town, the driver stopped abreast of my house, and told me he had a ton of horn-waste bearing my address. I got rid of this elephant the shortest and easiest way, by tumbling it into the manure cellar, and throwing the daily manure upon it until it disappeared from view. My men found combs, more or less perfect, among the mass, enough to supply their families for a year or more. This stuff is very rich in ammonia; but, though by layering it with horse manure, it might be softened and dissolved by fermentation, it is nevertheless so bulky that, even at a low figure, few farmers would care to invest in it. Leather scraps are an excellent material for mulching, and in time will decay and fertilize the ground; but if worked into tillage land they are a nuisance. They are also excellent for covering blind drains. I have seen drains put down thirty years ago, and then covered with this material, which are still in good working order.

In closing this subject I cannot do better than to quote the able remarks of Professor Goessmann: "The air contains at all times carbonic acid, and in most instances also nitric and nitrous acid and ammonia. The soil absorbs continually more or less of the former, and receives the nitrogen compounds in rain and snow. Once absorbed by the soil they find access to the plant by the roots, as carbonates and nitrates, where they assist in the formation of the organic portion of the plant. Besides this direct support of plant growth they serve, also, the very important purpose of increasing the supply of inorganic plant food; for they aid in the disintegration of the soil."

Discussion.

Mr. Gregory said, in reply to an inquiry, that he used nitrogen, in the various forms of which he had spoken, on vegetables; he

had never used it in fruit-growing. He mixes his fertilizers to suit different crops, using more potash for potatoes, and less nitrogen, than for cabbages or onions.

Major Henry Emery spoke of the effect of an excess of ammonia on the seeding of plants. It will give a large crop of fodder from corn, but the ears do not kernel out, and the same is the case with other plants. Corn wants phosphoric acid and potash.

Mr. Gregory said that he used fifty tons of fertilizers last year, which was but a small part of the whole quantity of manure used by him. He applied to corn, first active ammonia and afterwards something to perfect the seed. Corn does not need a great deal of nitrogen,—two per cent is enough,—but it wants a good deal of phosphoric acid. He thought a mixture of ammonia from different sources — the greater the number the better — was preferable to that from only one source. He did not wish to give the idea that plants want a great deal of ammonia.

Leander Wetherell thought nitrogenous manures, at the price they command in the market, too expensive to be purchased by farmers. He had tried superphosphate on good corn land, and found it better without than with ammonia. The corn was measured in baskets, and one basket was weighed, and the produce was seventy bushels of shelled corn to the acre, and a friend of his from Ohio said he never saw better corn there. The free application of ammonia tends to produce too much foliage and too little grain. A gentleman in Worcester got, in this way, an immense growth of wheat straw, but not enough grain to pay for threshing. Professor Atwater found that in many parts of Connecticut the soil did not need nitrogen. The only real question in regard to fertilizers is, whether farmers can afford to use them. They work well in connection with stable manure; superphosphate will make corn ten or fifteen days earlier than if it is not used,— a very important consideration in frosty seasons. The best course for farmers is to buy the constituents of fertilizers and mix for themselves.

Major Emery had used night-soil on corn, and got an immense quantity of fodder, but little grain. He had also used it on timothy grass, five hundred cubic feet of which, by measurement, is called a ton, but, treated with a large quantity of night-soil, it will give a thick bottom of short fodder, with little or no head, and will require six hundred and fifty cubic feet to the ton; being deficient in the elements of mineral weight, which is given to the stalks

by the proper proportional quantity of potash and phosphoric acid to correspond with the nitrogen.

Fifty bushels of corn (the estimated crop of an acre), of fifty-eight pounds to the bushel, weighs 2,900 pounds. This weight of corn will require 3,000 pounds of stalk and cob when dry, and will contain: —

Ammonia	40.22	pounds.
Phosphoric acid	39.31	"
Sulphuric "	11.30	"
Lime	18.57	"
Magnesia	17.13	"
Potash	74.78	"
Silica	83.92	"

If the quantity of potash and phosphoric acid is lessened, and the ammonia increased, it tends to increase the fodder and lessen the seed; but, if the ammonia is left out, a good, flinty corn will be the result. The stand would not look so well through June and a part of July, but at the harvesting the crop would be good, notwithstanding there was no ammonia.

The frost which often occurs about the tenth of September does much damage to late corn unless it is cut up before the frost and laid down or shocked, when it will harden and make fair grinding corn. If allowed to stand in the hill and the leaves are frozen, though not sufficiently to freeze the corn, the result will be soft corn. All chemical changes in the stalk cease after the leaves are frozen.

Col. Henry W. Wilson said that, functionally, nitrogen is the sack of the human system; the husk, and never the filling. Nature has provided pretty generally almost all the nitrogen wanted by plants, if other elements are furnished and the land is well-tilled. He believes that Nature replenishes her stores of nitrogen from the air. Farmers will do well to cease from the wild hunt for pure nitrogen. One great advantage of plaster is that it furnishes the base for compounds with nitrogen. Cyanogen is the element most in demand for peach trees.

President Moore said that the subject of nitrogen had puzzled him a good deal, but he had made up his mind in regard to it, and now he does not pay a dollar specially for it, though he might get some incidentally in bone, etc. He finds that with good cultivation

and plenty of phosphates and potash he gets as good crops as when he bought large quantities of sulphate of ammonia. Thorough tillage will develop the inert nitrogen of the soil in warm weather.

Mr. Gregory said that he did not bring nitrogen forward as a panacea. He spoke of the value of crude kainite, containing about thirty per cent of common salt and thirty per cent of chloride of potash. Agricultural chemists in Germany had found more ammonia in heaps of manure, when kainite was used, at the end of the year than there was before. Like salt or plaster it has the property of bringing out the latent power in the land, and producing crops that would not be got from it by high manuring. It has been found especially beneficial on low land, at the rate of about five hundred pounds to the acre. But the speaker warned those who might use it that it drives the soil.

A paper by Joseph H. Woodford, on "Heating Greenhouses," was announced for the next Saturday.

BUSINESS MEETING.

SATURDAY, March 21, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

No business being brought before the meeting it adjourned to Saturday, March 28.

MEETING FOR DISCUSSION.

HEATING GREENHOUSES.

By JOSEPH H. WOODFORD, Newton.

Mr. President and Members of the Massachusetts Horticultural Society:—

I have been asked by your Committee to say a few words about Heating Greenhouses, and they were particular in their request that what I should say should have a tendency to stimulate the discussion of this most important subject, so as to develop a general plan best adapted for the purpose; and, with this end in view, I beg to submit the following remarks.

I will say, in the first place, that simplicity and economy in the construction of heating apparatus have not yet been evolved from the minds of inventors to an extent sufficient to enable them to produce a simple, cheap, and at the same time efficient boiler for heating greenhouses, by either hot water or steam.

Any one would suppose that, with the great demand as a stimulator, and the wonderful facilities within the reach of inventors, some one of them would have turned his attention to this want of the horticulturist, and would have produced, long ere this, a heating apparatus, which, in its different sizes, would meet the wants of all; and of such moderate cost as not to nearly bankrupt the horticulturist before he completed his greenhouse.

In this connection I would say, that I think the horticulturist also is somewhat to blame for this state of affairs; for, when he contemplates building a greenhouse, what, as a general thing, does he do but look around and ask his neighbor what heater he is using, and then, without thought, adopt the same; or, perhaps, some other which some one else recommends as being superior? I know of only two horticulturists, in all my acquaintance with the craft, who are trying to improve their heating apparatus by their own handiwork; and what they are seeking for is simplicity of construction, economy of fuel, and at the same time efficiency.

In the one case a bank of horizontal pipes, surmounted by a coil of pipe, and all surrounded by brickwork, does good service, but with great waste of heat, which passes away up chimney, and ought not to be allowed to escape without doing service.

This waste heat might be used in heating water for watering plants, by placing in the chimney, in such a manner as not to interfere with the draught, a stack of pipe, through which the water should pass before using. This would be economy in the use of fuel, for we all know that a great quantity of heat passes off up the chimney which does no work and is wasted. Some authorities, who have looked into this important subject, say that half of all the heat, generated in or under the best of our horticultural heating apparatus, passes off without doing any good except to help heat up all out-doors. If we could build a fire which would last all night, and at the same time be of just sufficient intensity to properly heat the water in our boiler, there would still remain the same appreciable waste of heat. But even this cannot be done; and the question comes up, for that reason yet more exigently, what can be done with the heat that has been generated, but not utilized, under

the boiler, and is on its way up the chimney? If we cannot use this waste heat in any other way I think my suggestion of a coil of pipe in the chimney a good one where forced water is used, for all the water passing through it would become warmed to such a degree as to make it much more acceptable to growing plants than cold water, direct from the service-pipe or cistern.

The other gentleman to whom I alluded has constructed with his own hands a bank of pipe with the ends built into the surrounding brickwork and a fire-box underneath. The construction is faulty, and not to be recommended. On the top of the brickwork he has enclosed another space, through which he carries the water pipe to irrigate his growing crops. No doubt this last process will be beneficial, yet by it he does not utilize the waste heat, but is drawing constantly from the heated furnace. Therefore I am of the opinion that he would get still better results by carrying the irrigating water through a coil of pipes in the chimney. We all know that the temperature of a greenhouse can readily be reduced, and the growth of plants sadly checked, by the promiscuous introduction of cold water; and, therefore, we see the necessity of providing an economical means of supplying only warm water to growing plants.

Taking the foregoing remarks as a basis for my superstructure, I would further say, that a greenhouse heater should be constructed on scientific principles, such as shall secure adaptability for the purpose for which it is intended, together with simplicity of construction, and ease of getting at it for cleaning and repairs.

Under the first proposition we will say that the method of heating greenhouses by pipes conveying either hot water or steam is now conceded to be the best in use, and this presents the vital question: How can we heat water most economically and most expeditiously? Shall we continue, blindly, to use those boilers which are constructed in such a manner as to present to the fire a great mass of water in one solid body to be heated, or shall our boiler be constructed of pipes whereby the same body of water shall be exposed to the warming influence in small streams, and with augmented heating surface in the same space?

It strikes me that the same fire will heat the same quantity of water if divided in small tubes much more quickly, and to a more intense heat, than if in one body. Now it is an established fact that the hotter water can be made in the boiler, the faster it will circulate through the pipes, and in this way, and this only,

can a large space be heated either by hot water or steam. This point is worthy of close study and careful consideration, for the end to be attained by the horticulturist is the successful growing of plants, and to do this properly, in our cold winter climate, heat in requisite amount must be supplied all over the greenhouse, to produce the temperature required for the crop; and the only way to have at command proper temperature is to be able to heat the water in the boiler quickly.

Now, it seems to me that, for a successful heating apparatus, the water must be presented to the fire in such small, *continuous* divisions that it will become hot in the shortest space of time possible; therefore I would have my boiler constructed of tubes, and placed over the fire in such a manner that the greatest possible surface of pipe will be exposed to the heat before the heat shall pass off up the chimney and be lost. The construction can be very simple, and not expensive. For example: A bank of 1½-inch pipe, occupying a space 5 feet long, 2 feet high, and 2 feet wide, bridged in the middle by tiles, so that the heat from the fire built under one end shall pass through the bank twice before reaching the chimney. Let the bank of pipe be enclosed in brickwork, the top of this brickwork resting on gas-pipe bearings. The whole structure should project into the greenhouse, thereby saving all the heat radiated from the furnace. The feed door should be outside, to prevent coal gas from entering the greenhouse while stoking. This plan will make a fire-box 2 feet wide by 2 feet long, which would be sufficient for heating two greenhouses 100 feet long by 20 feet wide. The water is to pass in at the bottom of the bank of pipe, and out at the top, thus being in *one* continuous small stream of 100 feet long through the bank of pipes.

The flow of water in one stream through such a length of pipe (one hundred feet), and over a live fire, ought to heat the water very hot in a short space of time, thereby making it flow through the radiating pipes with such velocity as to cause its rapid return to the boiler after giving off its heat as required. This is the great secret of successful heating, and I ask for it your most careful consideration, for, with a higher initial temperature and rapid circulation, we shall not require such large radiating pipes as four inches to heat our greenhouses, nor so many of them; for what we require to properly do the work will be kept very hot, even in the return section, by the constant and rapid passing of the current through the fire in one continuous small stream.

I would construct the flow-pipe in such a manner, as it passes from the boiler, as to immediately empty itself into a stand or expansion pipe near the boiler, and on the top of this stand-pipe I would have a valve which would open under a definite pressure, liable to be generated in case of the great heat in the water inducing steam and otherwise entailing an explosion.

Some persons — and I am one of them — assume to say that the accumulation of steam in this stand-pipe will act as a force, provided the valve is weighted, propelling the hot water through the radiating pipes, thereby very much increasing its natural velocity, and returning it again to the boiler before it loses its heat. I cannot say, from actual experience, whether this stand-pipe will act as a force or not, but am confident it will so act, and that this theory will stand the tests of science and experience against any other theory.

I have never yet seen the expansion-pipe thus placed near the boiler; yet, when we reflect on the action of hot water and steam, it seems to me that this is the proper place for it, and I hope that the plan I now propose will so commend itself to some enterprising horticulturist that it will be tried at once, for I believe that in this way, and this only, can we accelerate the flow of hot water; and therein lies the whole secret of successful heating. I conceive that this stand-pipe can be placed in such a position in the greenhouse, and the flow can be taken from it at such a depression, as to preclude the necessity of placing the boiler below the level of the surface of soil in the greenhouse. This is another very important point in construction, and is worthy of great attention. Every boiler-pit I know of is a dark, damp hole, exceedingly objectionable in every possible way, often filled with water, and disagreeable to enter. But, with the method of construction I suggest, the whole arrangement will be on the surface of the ground, and the care of the fire can be looked at as a pleasure rather than a dread.

The chimney should receive the smoke on a level with the grate, or lower down, so that all the gases from the coal will be consumed over the fire and among the pipes constituting the boiler.

The radiating pipes in the greenhouse are to be in number sufficient to properly heat the space required, *and no more*. To have more than enough pipes is detrimental, because the surplus causes the water to move sluggishly, whereas our object is velocity, and

this can only be attained with the least quantity of pipes to accomplish the proper heating.

Another very important point in construction is, that the radiating pipes should be *continuous* and without a break till they again reach the end of the greenhouse where the boiler is situated, gradually falling to this point so that no air will remain at any point in the pipes when filled with water.

A single pipe will cross the entrance end of the greenhouse on a level with the door-sill, conducting the water directly to the boiler, thus making a continuous circulation.

The radiating pipes should be four in number, two inches in diameter, of wrought iron, with screw joints. They should be painted black with a preparation of oil and lampblack, for when they are so painted they radiate more heat than if left in their natural state, and they are also preserved from rust by this application of paint. They should also be hung up one above the other around the inside of the greenhouse clear of the wood-work and the ground, so that all the heat radiated from the pipes will go to heat the air in the house, instead of being absorbed by contact with exterior masses.

A greenhouse 100 feet long, 20 feet wide, and 10 feet high under the ridge-pole, built half-span roof, with the longest roof facing south, will require about 900 feet in length of 2-inch wrought iron pipe. This would give a radiating surface of about 590 square feet, amply sufficient to properly heat the house I describe. The glass surface will be about 2,300 square feet, and the solid contents of house about 15,000 cubic feet. The quantity of water in the boiler and radiating pipes will be about 130 gallons.

I wish to say a word in regard to the construction of the grate under my boiler. I would make it of 1½-inch gas-pipe, leading from a 4-inch pipe-head, which head can be extended to take in fresh air. This fresh air will pass through the grate into a conductor placed along one side of the greenhouse under the radiating pipes. This conductor can be constructed of old 4-inch pipes, perforated with graduated holes the whole length for the equal distribution of warmed air into the greenhouse.

This is quite a novel idea, but one which will, I think, commend itself to you as feasible, when you once reflect on the quantity of heat wasted in the ash-pit, and which will be made to contribute to heating the grate-bar pipes, through which a great quantity of air must pass when these pipes are hot. At all times this grate

will indirectly introduce a supply of fresh air to the house, and in quantity sufficient to keep the air in the house alive and sweet, without the necessity of opening ventilators in dull and unsuitable weather. I do not know of so good a manner to introduce fresh air to a greenhouse as this, and at so little expense to the heating apparatus by the absorption of heat.

There should be doors so constructed in one side of the brick-work as to enable one readily to inspect the pipes, and to keep them free from ashes and dust that will lodge upon them. Ashes and dust on boiler-pipes act as a repellent to the heat, thereby causing great waste of fuel, for it takes a great deal hotter fire to heat dirty pipes than clean ones.

Such a construction as I have tried to describe, it seems to me, will do more heating with less expense of fuel than the very much more expensive apparatus now used in nearly every greenhouse in this section of country can possibly do, and as it is simple in detail, easily comprehended, and not liable to get out of order, I confidently commend it to you as the *best* heating apparatus for a greenhouse.

I sincerely hope that my few remarks will stir up a discussion of the subject which will only end when we accomplish the purpose for which we are assembled, and that is to devise a cheap and economical way of heating greenhouses.

Since writing out the foregoing remarks I have had my attention called to another gentleman, Mr. George Cartwright, who has been quietly at work with this same end in view (the economical heating of his greenhouse), and, singularly enough, he has adopted some of my most important suggestions, and they work most admirably. He has his stand-pipe close to the boiler; but in one point it is not constructed as I have proposed, inasmuch as the water from his boiler enters the stand-pipe at the bottom, whereas in my construction it enters about midway, and I think my method best, as it seems to obviate a part of the water pressure from the stand-pipe on the boiler.

Mr. Cartwright's boiler is cylindrical, and it is also the fire-box, open at the top and bottom, and resting on fire-bricks just above a shake-grate, and the coal is fed in at this top of the cylinder. When he starts the fire a direct draught is opened into the chimney; but when the fire is well alight the direct draught is closed, and the heat passes, over the top edge of the fire-box and water-jacket, down the outside, all around, and enters the chimney below the boiler.

In this way he gets nearly all the good of his fire in heating water in the boiler or jacket. His copper boiler is 2½ feet high by 16 or 18 inches diameter, and he heats a house 180 feet long by 15 feet wide with five 2-inch pipes.

This idea of heating water under pressure was first brought to my attention by Mr. Denys Zirngiebel, who has it in successful operation at his place in Needham. And now I learn that Mr. A. P. Calder has adopted the same plan, and, if he is present, will tell us of his success. Before I put any thought into this subject I never supposed that water could be heated much hotter than the steam point; and it cannot if it is not confined; but when you once confine it and apply heat you can bring it to almost any high temperature you desire, therefore you will readily see that large spaces can be heated more quickly when pressure is used. I know of a great number of greenhouse men, who are warming their houses by trying to heat from twelve hundred to fifteen hundred gallons of water with a jacket boiler surrounding a fire, but with the boiler exposed to the damp air of the stoking-pit. In some instances they begin an intense fire at noon, and keep it up till ten o'clock at night, melting the coal into clinkers, wasting great quantities of heat and causing great anxiety. A gentle continuous fire under my boiler will keep the water always hot, and can be kept in the proper condition, when a cold night overtakes one, to immediately respond to a good stoking, and carry the temperature to a point to allay all anxiety, so that one can rest in peace.

Heating greenhouses is very similar to heating dwelling-houses. Some people think that if the cold air box is wide open a great amount of heat is sure to enter the rooms, whereas the opposite is the result; and the inmates of those houses are cold, and often remark that the furnace is not a good one. Now, if some one would kindly close the air-box down to a space six inches square, all the air coming through such a space would be warmed, and the furnace pronounced a good one. Just the same experience happens with radiating pipes in the greenhouse; two-inch pipes can be kept very hot with an ordinary fire, such as would only just warm four-inch pipes; therefore I would caution horticulturists not to put in more pipes than they can properly heat very hot, for when we get more than can be so heated we are throwing away fuel, and jeopardizing our plants.

DISCUSSION.

E. W. Wood was called on by the President, and said that he was only a learner, and had never seen a heating apparatus of the kind described in operation. If we can get a more rapid circulation, and less fire will keep it up, that is an advantage; but at present he goes to bed with more confidence than if he had only two-inch pipes in his greenhouse. Nothing retains heat better than water. He replenishes his fire at three P.M., and banks it at seven. A cold windy night like the last night makes it very difficult to keep a proper temperature in the greenhouse. He would rather have it 10° below zero and still, than 15° above and windy. He does not think so much heat is lost up the chimney as he formerly did; it does not amount to much except while the draught is open to start the fire. A neighbor who thought, from his chimney being so hot, that a great deal of heat was lost through it, ran it up the length of a house on a side hill; and although very hot while he was making the fire, shortly afterwards it was nearly as cold as if there had been no fire in it.

James Cartwright had known a boiler tried with a brick partition, as recommended by the essayist, which was afterwards taken out and a plate of iron was inserted, so placed as to avoid a downward draught, and it did better. He would prefer to have a dividing partition horizontal rather than vertical, as his experience had shown that it would work better; and it is better not to have a flue dip downwards. He thought a boiler built of pipes, as recommended by the essayist, should have them connected at both ends by means of a box or drum, instead of by returning bends in the pipe, which would make too much friction and obstruct circulation through the boiler, so that there would be danger of the pipes being cold in the morning. He thought a boiler built on the plan recommended should be from eight to twelve feet long: five feet would be too short. The stand-pipe was correctly placed near the boiler; when too remote the boiler will sometimes make steam and throw the water out of the stand-pipe, and then when the steam subsides the pipes will not be full and the circulation will stop. His son (Mr. George Cartwright, who was mentioned by the essayist) has his flow-pipe dropping to the end of the house, and the return-pipe dropping also; and he uses less fuel than with large pipes. The return-pipe is hot enough in the morning to burn your hand. If you get water very hot, with bell joints there is danger of their

opening, but with screw-joints you can go to bed and feel safe. He uses a copper boiler two and one-half feet deep, with a fire-pot twenty-two inches in diameter, and carries about ten pounds' pressure; and is now heating a house by means of five two-inch pipes with greater ease then formerly, when he used seven four-inch pipes, and it takes less coal to do it. He thought a copper boiler would wear better than an iron one over a coal fire.

Mr. Woodford said that in his plan the pipes go round the house and into the boiler.

Col. Henry W. Wilson said that there are certain axioms in heating, and the best way known to scientific men for heating water is the best for horticulturists. Great ingenuity has been expended on apparatus for heating cars. The scheme proposed by the essayist has been gone over before, and it has been found that you cannot get a draught with a large chamber and a small aperture. You cannot ventilate a room by an opening into one above it. A vertical boiler is preferable to a horizontal, for all the motive of circulation is the difference in the specific gravity of hot and cold water. If water is heated you want to give it as rapid a vertical motion as possible. Friction in large pipes is less in proportion than in small pipes. Iron is not so good a material as copper or brass for a boiler, though its greater cheapness makes its use more general. Copper is a far better conductor of heat than iron. Iron is a poor conductor; if a perfect conductor be rated as 100 iron will rate as 14. The thinner the pipe is the better, so far as regards the conduction of heat. Cast iron, as being thicker than wrought iron, is not so good, but is preferred, because less subject to rust. Water itself is a very poor conductor of heat, but is able to absorb and retain a very large amount; which can be carried, by convection, to a considerable distance from the fire, — hence its value as a circulating medium. Lampblack makes an excellent paint for radiating pipes, causing more rapid radiation, which is the reverse of absorption. The radiation of lampblack is to that of iron as 100 is to 64. A tin dipper filled with hot water, if black, loses heat twice as fast as if bright.

Mr. Woodford said that he would put on a pressure of ten pounds to promote the circulation.

Col. Wilson said that the best car-heaters have no pressure. Mr. Woodford is right in placing the stand-pipe near the boiler. The expansion of a thousand gallons of water caused by heating to 212° would fill a barrel. With a vertical partition in the stand-

pipe, it would work twenty-five per cent better. The only advantage in running a water circulation under pressure is to be found in the slightly higher temperature which can be gained. Pressure is solely from the effect of steam. A pressure of five pounds to an inch, equal to about eleven feet head of water, would raise the temperature of the water when boiling to 238°, instead of 212° as in the case of open pipes. When we run under pressure we require stronger apparatus and tighter joints; and, if pressure were to be used at all, he would prefer steam, which is very easily managed. There will be a tendency to form globules of steam, which will rise in vertical pipes, and every particle must be replaced by the return-pipe. You cannot heat pipes by the plan of the essayist: there would be no heat in the two lower pipes; the water will take the shortest route to return. The most intense heat applied to the surface will not heat water a foot below it.

The speaker formerly objected to steam, but has modified his opinion in regard to it. He spoke of George Hill's house, at Arlington, as one which it would repay all interested to visit. Mr. Hill has the newest arrangements, and one foot of surface of the steam-pipes heats thirty cubic feet of the greenhouse. He has an upright boiler, which is the best heating unit, and the steam goes to the end of the house, and returns by six pipes an inch and a quarter in diameter. He uses a pressure of one pound to the square inch. There is a compensating valve by which a uniform pressure, equal to 215°, can be maintained for ten hours during sudden and severe changes of weather. The pressure could be increased if desirable; but it is not. The adjustment is simple and automatic. One of the advantages of steam over water is that it takes but very little time to heat up or to cool off the pipes, and, with good apparatus in good hands, it is more easily managed than hot water. Another advantage is, that steam affords the easiest way to moisten the air of the house when too dry; which is a protection against freezing in cold weather. A house will cool off more quickly if the air is dry than if moist, because the capacity of moist air for heat is three times as great as that of dry air.

The study of this subject will be more profitable to the owners of greenhouses than that of any other; indeed, it has an application to every part of life. Some kinds of glass will transmit the heat of the sun better than others. Great care is needed in the selection of glass for greenhouses. Any one wishing to understand the very complex questions offered by the subject of heating would do

well to study the work of Professor Tyndall on heat. He is the best authority, and his experiments can be tried by anybody.

Mr. Woodford said that Mr. Zirngiebel's houses were the first he ever saw heated under pressure. He has four houses heated by one boiler, the expansion-pipe being a hundred feet from the boiler. The furnace is like that recommended in the essay, though he could not say about the partition, but it has a coil of pipe, like a beehive, on top. An arm runs to each of the four houses, and they are heated better than any others of his houses. The whole of the water in them moves. He has a ventilator, which he opens, so that the chimney is cold. The speaker could not understand why the two lower pipes in the plan proposed by him should be cold. In this plan the furnace fire goes up and afterwards down.

William C. Strong thought that the use of steam would be more general in future, especially in large establishments where several houses are to be heated from one fire.

William D. Philbrick remarked that there seemed to be some confusion of ideas with some of the speakers in regard to the use of pressure in hot water circulation; its only advantage is in the higher temperature which can be given to the pipes; it does not render friction less or circulation more rapid, and is objectionable on account of the greater difficulty in keeping the pipes tight. If pressure is used, there must be a safety-valve on the stand-pipe or elsewhere. It is possible, under high draught on a windy night, for the water to boil over and be thrown out, so as to leave the upper part of the circulating pipes full of air and steam, which would obstruct the circulation. If he wanted pressure he would prefer steam. Mr. Hill's apparatus works perfectly.

Mr. Woodford spoke of the advantage of a greater quantity of water than is found in steam pipes.

Col. Wilson said that this advantage would not exist if the arrangements were properly made. Mr. Hill's house was kept at a temperature of 40° when the thermometer outside showed 15° below zero. The adjustment is simple and automatic, a variation of one ounce per square inch in the pressure changing the regulator; and it obviates the objections previously made against steam. The speaker knows you can send ten times the heat through pipes with steam that you can with water.

Mr. Wood said that he has a steam-heater in his dwelling-house, and though he has an automatic arrangement, he burns twice the coal there that he does in his greenhouse with hot water. He

thought the slowness with which large water pipes cool off when the fire goes out an advantage, but steam pipes get cool in fifteen minutes; and you have got to have a certain amount of heat to get steam. He makes up the fire in his greenhouse at three o'clock, and at seven leaves the draught slightly open. Mr. Hill grows cucumbers in his house, and these require more heat than the plants in the speaker's greenhouse.

George Hill said that this was his first winter with his steam-heating apparatus. He looked at a neighbor's which was satisfactory, and put in the same sized boiler. His house is one hundred and sixty-three feet by twenty, with the boiler at one end. The steam flows in a two-inch pipe and returns in six pipes an inch and a quarter each. He can get up steam with wood in fifteen or twenty minutes. Last December, when the thermometer was at 15° below zero, he fired up at eleven P.M., and gave no more fuel until nine A.M., and the temperature did not vary more than two or three degrees from fifty, without any attention. This morning (which was very cold for the season) the thermometer in this house was up to sixty, and he had to open the windows and admit air. Nothing more would be required until two or three P.M. In a cold morning the coal is exhausted more than in mild weather, when the damper is closed. He uses a cast iron sectional boiler, under one pound pressure. He thought it would not be long before we could run a house from six to twenty-four hours by an automatic arrangement. His house is on a side hill, and he thinks of putting up another. He might lose some heat up the chimney. With hot water pipes, if the sun comes out, the large body of heat in the water is wasted.

Mr. Woodford said that opening the windows directly against the pipes and letting in the air would cool off the pipes.

Mr. Strong said that it is a very serious evil, when the sun comes out, to have a great body of hot water in the pipes. He has felt that we extracted more of the caloric from the fuel in furnaces surrounded by water pipes than when steam is used; and thought that with vertical boilers a great deal of the heat went up the chimney.

Col. Wilson said that the steam fire-engine is the most perfect generator of steam; it will heat up in five minutes. Mr. Hill's boiler requires only fifteen minutes. Steam travels with great rapidity. The speaker predicted that the coming boiler will be small, with the amount of water reduced to the minimum.

Water-pipes will rust, and you are gone. He used a three-inch wrought iron pipe for hot water eight years, and it was so filled with rust that you could not see through it. Cast iron will not rust so badly as wrought iron. Asphaltum is a poor conductor; but it might pay to coat hot water pipes with it to prevent rust. It has been proposed to use crude petroleum as a heating medium instead of water, but it would be dangerous to introduce it into pipes, for it contains water, which the heat would evaporate. Besides, the inflammable vapors of petroleum are heavier than the air, and if they escaped from the stand-pipe would flow to the fire-room, and cause explosions.

Levi W. Hastings said that he has had no experience with hot water, but has used a steam-boiler like Mr. Hill's, but larger, for the last three years, and found it satisfactory. He raises chiefly roses and pinks. He has four houses, each one hundred feet long, two of which are ten feet wide, one eighteen, and one twenty; making six thousand square feet, with span roofs, all heated by one boiler. If you heat by means of water, and get up in a cold night and find the pipes cold, it takes a good while to warm up; but he can get up steam in fifteen or twenty minutes. His boiler works automatically; he puts on a three-pound weight at night, and gets up at six in the morning, and finds a pound pressure. He uses about forty tons of coal in a season. He used from fifteen to seventeen tons in the first house, and then added two more houses and used thirty-five tons. The boiler did not work well, and he put in a larger one, and he thinks he could run double the number of houses he has now with ten tons more of coal.

The Committee on Discussion announced for the next Saturday a paper by Professor G. C. Caldwell, of Cornell University, Ithaca, N.Y., on "A Comparison of Manures for the Orchard and Garden."

BUSINESS MEETING.

SATURDAY, March 28, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

E. W. Wood announced the decease of Hervey Davis, and moved the appointment of a committee to prepare memorial resolutions. The motion was carried, and the Chair appointed as that Committee, Mr. Wood, Robert Manning, and Benjamin G. Smith.

The meeting was then dissolved.

MEETING FOR DISCUSSION.

A Comparison of Manures for the Garden and Orchard.

By Professor G. C. Caldwell, Ithaca, N.Y.

How to manure the garden or the orchard for the most profitable results is one of the most difficult questions that the horticulturist has to meet. Of the biggest and most solid cabbages, the earliest peas, the largest squashes, the sweetest and most prolific berries, the handsomest and most delicately flavored grapes, the most luscious peaches or pears, the earliest or the best late-keeping apples, he has an unlimited variety offered him by all the seedsmen or nurserymen in the land; and he need find no difficulty whatever in laying out to good advantage all the money he has to spare for use in this direction. Of the most suitable land on which to plant all these crops there is enough and to spare somewhere in all this wide country. Of tools and labor-saving machines of every kind, and of men and animals to run or to use them, there is no scarcity. In respect to all these supplies there is only embarrassment of riches; and no crop need fail of producing good fruit abundantly, from any want of liberal provision for its highest requirements on any of these lines.

But is there such a superabundance of supply, when we come to the matter of the highest requirements as to the food for these crops? Is there a sufficiency of a supply of such kinds of food as will, in the general run of garden and fruit culture, give the surest results? Is not the gardener's call always for more stable manure? and is the call of the fruit grower any less loud? One naturally asks, why is this so, when there are, elsewhere at least, immense if not inexhaustible quantities of the nitrogen, phosphoric acid, and potash, that are reckoned as so important plant nutrients, all to be had for the purchasing, and under so great competition that they ought to be had for as low rates as they can be sold for, paying fair profits. They can be had also in every form of combination, and every degree of assimilability, and in any desired mixture; and, further, to save the farmer or the gar-

dener the trouble of studying out for himself the kind of combination that his crop needs, mixtures are offered to him, ready made up, for each crop.

Abundant as these commercial supplies are, they do not seem fully to answer the purpose; for I doubt if the demand for animal manures is any less urgent now than it was before commercial manures became the important articles of trade that they now are. Yet, in agricultural operations, superphosphates, bone meal, nitrate of soda, and the like have, in some few cases, been made to take the place, entirely, of stable manure, with profit.

Perhaps you have heard the history of Mr. Prout's farm in England. Mr. Prout bought this farm in 1861; it comprised four hundred and fifty acres, and its cultivation in the manner to be described was, therefore, no small plot experiment. It was, when taken in hand, in a low condition of fertility; the owner asked the aid of the eminent agricultural chemist of England, the late Dr. Voelcker, as to the best way to bring the farm into good condition again. The advice was to dress it well with stable manure. After doing this with unsatisfactory results for two years application was again made to the chemist, who told the owner to use more stable manure; he said he could not afford it; then the chemist visited the farm again, examined it carefully, and suggested the use of commercial fertilizers after a certain plan. The plan was followed, and bone dust, superphosphate, dissolved guano, and nitrate of soda were the only manures used from that time on. The crops, — clover, hay, grain, straw, and everything, — were all sold standing; only an insignificant quantity of manure was made, the cultivation being almost entirely by steam. This system has now been carried on for more than twenty years. The estate cost the purchaser in the beginning, $74,500; enough more was spent upon it in improvements to make the total cost about $100,000. The annual clear profits have been, on an average, about $4,500; and it was estimated that the farm could be sold, eight years after it was taken, for twice what it had cost. Last fall the crops were reported in the "English Agricultural Gazette" as looking well, and the system was spoken of as continuing to succeed, although with the qualification that some fallows had been found necessary.

This is not the only instance on record of this kind of farming. Other cases have been reported where the system has been followed for forty years, in Germany. I give these few details in regard to

this one instance merely to show what can be done with commercial manures when intelligently used, — to show that they do contain all the food required by crops, — and that, with their assistance only, a farm can be brought up from a low condition to a higher one, and held there for a series of years; and no one can show that what is true of farm crops should not be true of garden and fruit crops as well,—if not to the same extent, yet to a large extent. They feed on the same kinds of soil, and in the same manner, and require the same nutrients in general; and the same particular nutrients that are specially important for farm crops are, so far as we know, specially important for garden and fruit crops; the proportions required may be different, but perhaps not more so than they are even for different farm crops: the same mixture of nitrogen compounds, phosphate, and potash salts will not answer equally well for wheat and for potatoes, nor even for wheat and for corn, which are more nearly alike than wheat and potatoes.

What are the obstacles in the way of the more extensive use of commercial fertilizers in the garden and fruit orchard, and of less dependence on the products of the city and village stables? In answering this question we naturally ask, first, what does stable manure contain that is not supplied in commercial fertilizers?

The valuation of a commercial fertilizer in the trade is based, as you know, on the quantities of nitrogen, phosphoric acid, and potash that it contains, — some fertilizers containing only one of these nutrients, others two, and others all three of them. There is no question that in respect to just these nutrients we can meet the wants of any crop better by supplying commercial fertilizers than we can by stable manure, if there is any difference between the two as to efficiency. But, besides these, the crop must find in the soil, supplied from some source, lime, magnesia, sulphuric acid in the form of sulphates, of which plaster is one, a very little iron, possibly chlorides, of which common salt is one, and, perhaps, silica. Every superphosphate contains an abundance of lime and of sulphuric acid. The muriate of potash, brought from Germany, is a chloride, and contains chlorine. Of iron every soil has an abundance, many thousand times more than any crop needs; and the same is true of silica; of magnesia there is enough to be had in the German kainite. But as to all of these nutrients last mentioned — sulphate, chloride, silica, iron, and magnesia — there is no proof that the average soil is not abundantly rich in them for the production of good crops. Hence it is that we are justified in

charging all the cost of a commercial manure to, and in expecting to get our money back from, its nitrogen, phosphoric acid, and potash; the rest of the ingredients must be thrown in gratis, as of no value generally, although there may be cases where one or another of them may be of some service. All of these matters the stable manure also contains in abundance.

So far no one can claim anything for the stable manure that is not supplied by the commercial fertilizer. The only respect in which the two materials are distinctly unlike is this: the stable manure is composed largely of dead vegetable and animal matters in process of decay; the product of this decay is the humus or vegetable mould of the soil. About one-fifth of ordinary stable manure is made up of this vegetable and animal matter, while not over six to eight thousandths is potash, five or six thousandths nitrogen, and three thousandths phosphoric acid. Of nitrate of soda, so much mentioned as a very useful fertilizer for its nitrogen, one-sixth is this nitrogen. Of a good superphosphate, as this fertilizer averages in this country, about one-eighth is phosphoric acid; and if one desires it, and is willing to pay for it, he can have a superphosphate with one-third its weight of phosphoric acid; of a German muriate of potash from a third to a half may be potash. But in all these materials there is no vegetable matter, and little or no animal matter.

Here, then, is a clear distinction between the two kinds of manure, the stable and the artificial: the stable manure has its few thousandths of nitrogen, of phosphoric acid, and of potash, and its one-fifth of decaying vegetable and animal matter; the commercial manure only its few thousandths or even less of animal matter, and its proportions of nitrogen, phosphoric acid, and potash counted by eighths to thirds. About three-fourths of the stable manure is only water, however; expel this, and get a manure as dry as commercial manures ordinarily are, and the comparison between the two will be more just and no less striking; we shall then see that four-fifths of this dry manure is decaying vegetable and animal matter, about one-fortieth is potash, one-eightieth phosphoric acid, and one-fiftieth nitrogen.

Can any way be now shown in which this striking difference between the two kinds of manure may account for the greater measure of success that is attained in general with the stable manure?

As already said, decaying vegetable or animal matter in the soil

makes humus, or vegetable mould. This common ingredient of all arable soils is not necessary for plant growth; for, on a small scale, in pot culture good crops have been obtained in a soil as white as snow, and therefore quite free from any humus, but containing all the real plant nutrients that have been mentioned. But that this humus is an important ingredient of a fertile soil no one can doubt. Given two soils equally rich in nitrogen, potash, phosphoric acid, lime and all such matters, but of which one is poor in humus and the other rich in it, but yet not so excessively rich as a bog or a muck bed, there is not a farmer or gardener who knows soils who would not give more for the soil rich in humus than for the other. In the course of the decay of these vegetable matters several acid substances are formed, and chiefly carbonic acid. These acids act on the large quantity of difficultly soluble plant food in every arable soil of fair quality, and aid in bringing it into solution, and thus within easy reach of the plant. Few farmers realize what a large native stock of crop food they have in their soils. In the case of a fertile soil from a Western State, analyzed some time ago in Germany, there would be, by calculation from the analysis, in one acre of it, and within a foot from the surface, 2,400 pounds of phosphoric acid and 7,000 pounds of potash. But nobody in New England has a Western prairie soil on his farm; nevertheless, judging from analyses of twenty-five different soils of average quality by the same chemist, we may say that an average good soil will contain, within twelve inches from the surface, and therefore accessible to the crops, and fit for plant food if any means can be provided for bringing it into solution, 1,500 pounds of phosphoric acid, 1,500 pounds of potash, and over 1,750 pounds of lime. Compare these amounts with those that a crop takes up, and one can realize more fully the native value of a good soil. The quantities of phosphoric acid and potash in pounds, per acre, required by some of the more common crops are shown in the following table: —

	Phosphoric Acid.	Potash.
Corn, 50 bushels and its stover . . .	50	70
Potatoes, 150 bushels	15	50
Wheat, 25 bushels and straw . . .	18	25
Apples	20	50

These native supplies, then, so very much larger than the yearly demands of the crops, if we can bring them into use only a little

every year, may go far towards producing these crops for the farmer or gardener. If humus by its decay helps to bring about the solution of these supplies, then it must be useful, since all such plant food must be taken up in solution.

That the carbonic acid, which is one of the main products of the decay of humus, does in some way favor vegetable growth is very neatly illustrated by an experiment preformed many years ago by Stoeckhardt. Three deep glass vessels, two of which had holes pierced through the bottom, were filled with soil, and peas were planted; through the hole in the bottom of one of the vessels and up through the soil there was passed every day a certain quantity of air, and up through the soil of another of the vessels a mixture of air and carbonic acid; the third vessel was left to itself, and the condition of things in it was about the same as in an ordinary soil with a very compact and impervious subsoil. The weight of dried crop produced in the third vessel without any circulation of air was about 90 grains, in the soil through which air was circulated, 162 grains, and in the soil through which air and carbonic acid were circulated, 190 grains. In some way the carbonic acid along with the air helped the crop amazingly, more than doubling it. This was not necessarily because the plant fed on this carbonic acid directly to supply itself with that most important element, carbon. It has been proved over and over again that vegetation supplies itself with carbon, at least mostly, if not entirely, from the carbonic acid of the atmosphere. The fair presumption is that the carbonic acid passed through the soil brought more plant food into solution, and so the crop was more liberally provided with this means of growth.

In support of this presumption we have the fact, demonstrated also by Stoeckhardt, that the very soil which produced the largest crop, and therefore had yielded up the largest amount of dissolved plant food, still contained the largest amount of soluble plant food, ready for the next crop. The quantity of such soluble food was, in the soil of the closed cylinder without any circulation of air, 22 grains; in the cylinder furnished only with air, 43 grains; and in the soil to which both air and carbonic acid were supplied, 60 grains.

You will have noticed that the second soil, receiving only air, also gave a notable increase both of crop, and of soluble plant food left for the next crop. On first thought this result would appear to conflict with the explanation given of the increased crop in the third soil, that it was due to the carbonic acid passed through that

soil along with the air. But there is not necessarily disagreement here; it is quite reasonable to suppose that the humus in this soil, together with the oxygen of the air that was circulated freely through it, produced the same effect and in the same way as was produced by the carbonic acid ready formed in the third soil. The formation of carbonic acid from the humus can take place only in the presence of oxygen, and the more liberal the supply of oxygen the larger will be the production of carbonic acid from a given quantity of humus. In this second soil we had, as in all the others, the ordinary quantity of humus; the supply of air, with its one-fifth part of oxygen, was liberal; carbonic acid must have been produced freely; and it would have been strange if there had been no increase of crop. Such a result would have tended to disprove just what we are seeking to prove, that the humus does a good work for the farmer by the carbonic acid given off in the soil as it decays, or oxidizes, which two terms mean much the same thing.

Another experiment shows in a no less striking manner the part that humus may take in bringing plant food into solution: a sample of a sandy loam was compared with another portion of the same soil to which some humus had been added; in the course of the summer months, while a crop was growing vigorously on these soils, the quantities of potash that became soluble in the two soils were as 366 parts in the soil poor in humus to 574 parts in the other; the quantities of plant substance produced in the two cases were 5,040 and 9,800 parts.

That the presence of decaying vegetable matters or of humus in the soil does increase the proportion of carbonic acid there, is fully shown by analysis of the air in the pores of the soil. The air above the soil contains 3 parts of carbonic acid in 10,000, while that in the soil may contain ordinarily 100 parts in 10,000; and, moreover, such richness in carbonic acid is found only in the air of soils containing humus. A rich dressing of stable manure, or, in other words, a large addition of decaying, humus-forming substance, largely increases the quantity of free carbonic acid in the soil. An asparagus bed that had not been manured for a year contained in the air in the pores of the soil 122 parts of carbonic acid in 10,000, but when recently manured 233 parts. Another, a surface soil rich in humus, had 540 parts of carbonic acid, a newly manured sandy field 333 parts, and the same soil, in wet weather, 1,413 parts, of carbonic acid in 10,000 of its air.

This function of the humus of the soil can also come into use, with respect to the plant food added in manures. To me, one of the most interesting properties of soil is that remarkable power it has of absorbing certain valuable plant nutrients, holding them in a difficultly soluble condition near the surface, so that, however much rain may leach through the ground, they will be only very slowly carried down deeper, or washed out altogether. Thus the soil behaves with phosphoric acid, with potash, and with the ammonia that is so valuable for its nitrogen. For these three substances any arable soil that is not too sandy is a most trustworthy savings-bank. Therefore, although we should make much account in buying a fertilizer of the proportion of soluble phosphoric acid, or potash, or nitrogen compounds in it, yet, in all probability, to say the least, our crops take up but a little of these nutrients before they are changed by this fixing power of the soil into a difficultly soluble condition.

Why, then, it will naturally be asked, should we pay ten cents a pound or more for soluble phosphoric acid when we can get good insoluble acid for six cents or less, if what we put on the soil as soluble so soon becomes insoluble? For this reason, partly, that the even distribution of the food through the soil is a matter of much importance. Any one can easily understand that if a bottle of the much-advertised, and I suppose very useful tonic, Horsford's acid phosphate, were poured over half a bushel of soil, and washed in with a slight drenching of water, phosphoric acid would be far more thoroughly mixed with that soil than, by any reasonable amount of stirring such as one could afford to give to a cultivated field, he could distribute two ounces of dry superphosphate through the same quantity of soil. So, when 400 pounds of superphosphate are applied to an acre of soil, in spite of the best of the usual cultivation that could be given to that soil the fertilizer would remain in little scattered particles here and there; but let the rain take it into solution for a short time, and distribute it over the surfaces of many hundred thousand particles of soil, so that the feeding rootlets find it wherever they go, and how much wider and more even the mixing of the fertilizer with the soil will be; and yet, so quickly does the soil seize hold of this traveling plant food, and insolubilize it, if I may borrow a very convenient French word with a very plain meaning, that it cannot stray far off.

Practically, then, every crop has to procure all its phosphoric

acid, all its potash, and a part at least of its nitrogen, from difficultly soluble compounds in the soil; and I think it is now easy to understand why, as so often observed, commercial fertilizers do their best work when used with stable manure: the abundance of carbonic acid generated by the fresh application of such manure assists in the re-solution of the insolubilized phosphoric acid and potash of the commercial manure, as well as of the difficultly soluble native food of the soil. Some writers consider this to be such an important function of stable manure that they condemn the practice of allowing it to rot in the yard at all; they would have all the decay go on in the field, just where the products of this decay are needed for their action on the soil. It was somewhat interesting as well as amusing, while I was writing this, to meet with the statement in an English paper, that a patent had been taken out in England for charging a soil with carbonic acid through pipes laid near the surface. A few good results of such a system would be worth more in illustration of the principle that I have been explaining than the patent will ever be worth to the inventor. No results are given, but you see that it is exactly what Stoeckhardt did, and I have no doubt that it would increase the yield of crops; but, as long as we can still get hold of any humus-forming material at reasonable rates, we have a far cheaper method of attaining the same end.

There are other ways in which humus may, and doubtless does, favor the production of crops; but, to my thinking, all of them taken together do not sum up for so much as does this one way that I have been speaking of.

We can compare stable or other animal manures in another way that may explain the reason why less satisfactory results are sometimes obtained with the latter; I refer to the comparative cost of plant food in the two kinds of manure. You are aware that the Directors of the Experiment Stations of Massachusetts, Connecticut, and New Jersey have, in the past few years, conferred together in the spring to determine what may be considered as a fair valuation per pound, of nitrogen, phosphoric acid, and potash, in their various degrees of solubility as found in these manures. The figures thus given represent the retail cost of these substances, in the markets of the State where they are sold as raw materials to be worked up into the various brands of fertilizers offered for sale during the year.

On the basis of this scale of values adopted for 1884 I think it

is fair to assume that when a gardener or a farmer buys potash in a commercial fertilizer, with the same degree of solubility and availability for plant food as in ordinary animal manures or other animal waste used for manure, he will have to pay at least five cents a pound for that potash; for phosphoric acid of like solubility and availability as in these domestic manures he would pay about nine cents a pound, and for nitrogen, sixteen if not eighteen cents; I take the lower figure to be sure that I am within bounds.

How do these prices compare with those actually paid for these plant nutrients in such animal or vegetable manures as gardeners or farmers buy?

Two or three years ago there came to me from a gentleman of this neighborhood a series of questions as to the comparative cheapness of several of these manures. The questions could be answered, at least with approximate satisfaction, since the inquirer was fortunately able to give me the cost per ton, at his own place, of all the materials in question. I had not time to analyze samples of the manures, and for the necessary information as to their composition I had to refer to the tables giving the average composition of such matters; if my estimates could have been based on actual analyses of the materials, they might have been somewhat, but certainly not very, different.

The results of my calculations are set forth in the following table: —

Kind of Manure.	Cost per 1,000 pounds.	1,000 pounds contained of			Cost, in cents, per pound of the		
		Nitrogen.	Phosphoric acid.	Potash.	Nitrogen.	Phosphoric acid.	Potash.
Cow manure	$1 16	4	1.6	3.6	19.2	10.8	6.0
Horse manure	1 54	7	1.5	9.5	14.1	7.9	4.4
Night-soil	43	7	14.0	2.0	2.8	1.6	0.9
Rockweed	1 21	4	2.3	4.0	20.5	11.5	6.3
Fish-chum, half dry	6 50	43	50.0	. . . .	9.1	5.1	. . . .
Hen manure	4 00	10	6.0	5.0	27.0	15.0	8.4
Tanners' waste	78	72	19.0	. . . .	0.9	0.5	. . . .

If my figures are not wrong, the cow manure is not a cheap source of plant food; it would have to be looked upon as more costly than commercial fertilizers were it not for the large amount of humus-forming material that it contains; this may offset the high cost of the important plant nutrients in it. But then we have just as much of this humus-forming material in horse manure; and the important plant nutrients in that, instead of being more costly than in the commercial fertilizer, are actually cheaper. The night-soil costs nothing except for the hauling; the plant food in it is remarkably cheap, costing only about a fifth as much as in horse manure; and one can see no reason why a pound of nitrogen in it should not be just as good for crop production as a pound of the same nutrient in horse manure. Rockweed is an expensive manure, much more so than commercial manures, while the plant food in it certainly cannot be any more available or valuable than in fine bone meal, or in good horse manure, or than in the fish-chum, which provides nitrogen and phosphoric acid at half the cost.

Hen manure is another expensive fertilizer: its plant food costs more than that in any other fertilizer, natural or artificial. Even nitrogen in ammonia salts costs only twenty-two cents, and phosphoric acid in the best superphosphate only ten cents a pound. From my point of view I should say that a great deal more was paid for that manure than it was worth. As to the tanners' waste I had to do some guessing; I took it to be mostly hair and clippings of fresh skins; it cost nothing, except for the hauling. If I was right in my conjecture as to its character, it is rich in both nitrogen and phosphoric acid, and is by far the cheapest manure of all; but its action may be much slower than many of the other manures in the list, which would detract from its value. Granting all that, it would still appear to be a very cheap manure.

Making all due allowance throughout these estimates for the possible deviations from the general average composition of such materials, I still affirm that where they come out so widely apart as they do in some cases, they indicate real and undoubted differences in the cost of the plant food, that may be of considerable practical importance to the buyer of such manures.

We may look for a moment, before I close, at this same matter from another point of view. On the University farm at Cornell, Professor Roberts, by a careful system of saving and housing his stable manure, and rich feeding of his stock, largely milch cows, has obtained a product that, analyzed in my laboratory, was found

to contain .7 per cent of nitrogen, .4 of phosphoric acid, and .84 of potash. The manure was applied at the rate of ten tons to the acre, which quantity would contain about 150 pounds of nitrogen, 80 of phosphoric acid, and 160 of potash. These amounts of the three nutrients would cost, in a commercial fertilizer, at the same rates per pound as in the other calculations whose results have been given, about $40; but this ten tons of manure did not begin to cost so much, — it was the waste of the animals producing a revenue by their milk or growth or work. It did undoubtedly cost something, but I think it is safe to say not over $1.50 a ton, or half as much as the horse manure, of which an account has been given above. This would make the plant food in it cost less than half as much as in that manure, and much less than in commercial fertilizers.

It may seem to many that thus far I have spoken only unfavorably of the use of commercial fertilizers; but I would not wish to leave you with the impression on your minds that I regard them with disfavor. On the contrary, I do not believe we could get along without them in general crop growing; and I see no reason why, if they are judiciously used, they should not do as much for horticulture as they are doing for agriculture. If the farmer succeeds better in getting profitable returns from an investment in a certain quantity of nitrogen, phosphoric acid, and potash in a superphosphate than the horticulturist does, it may be because the latter has not learned by experience, as the former has, how to get such returns; and as long as he can procure animal manures by any sort of management he will continue to use them rather than get out of the ruts and learn how to use something else in place of them. So far as the humus is concerned, on whose apparent usefulness I have dwelt so long, its due proportion in the soil can be maintained by green manuring, and without getting or making much stable manure; or by spreading over the uplands some of the contents of the muck deposits that are to be found on so many farms.

In order, however, to enable these commercial manures to compete with the cheaper plant food in animal manures, they must be bought at such rates, and in such ways, as to reduce the cost of the plant food they contain to as low a point as possible. A comparison of the cost of plant food in mixed fertilizers, such as superphosphate and special manures, with cash prices for precisely the same quality in the raw materials used by the manufacturers

for making up these mixed fertilizers, shows that in the last two years consumers have paid from 18 to 20 per cent more for the plant food in the former than in the latter, or the raw materials; or, stated in another way, about $33 expended in the raw materials would buy just as much and just as valuable plant food as would cost $40 in superphosphates or specials. These figures represent the *average* difference in favor of getting the raw materials directly; sometimes the superphosphate is sold at such low rates that its plant food is almost as cheap as in any other form in the market; but, on the other hand, the difference is sometimes very much larger in favor of the raw materials. For instance: in one case a Connecticut farmer was asked to pay, and perhaps he did pay, $45 for a certain quantity and quality of plant food that would have cost him but about $26 in the raw material. These raw materials are such as nitrate of soda, sulphate of ammonia, dried blood, and dried and ground fish-waste, any of which may be used for charging a fertilizer with nitrogen; plain superphosphate — that is, without any nitrogen —for supplying the soluble phosphoric acid; and potash salts for the potash.

A Connecticut farmer tried this home mixing last year, using four tons of dissolved bones, one ton of muriate of potash, and one ton of sulphate of ammonia, making thus an excellent and really ammoniated superphosphate; it cost him, including materials, freight, and labor, $36.20 per ton; analyzed at the Experiment Station, it was reported to be worth, at current prices, $45, which was a very much better showing than was made by any one of the fifty samples of superphosphate analyzed at the same station during the year. The consumer had at the same time the great advantage of knowing just what the mixture was made of; that, for example, its nitrogen was in the form of sulphate of ammonia, the most costly and the most valuable form of nitrogenous plant food, and not of roasted and ground leather waste, an utterly worthless form of nitrogenous plant food. Other farmers of that State have done likewise, and with good results also, both in the analysis and in the field.

Instead of closing with some flourish of a peroration, it will I think be more in keeping with the character of my lecture if I should sum up in a few words the main points which I have attempted to explain or illustrate: —

1. That if the elements needed for the food of the gardener's or horticulturist's crops cannot be obtained in sufficient quantity

from stable manure, or other animal waste, they can be procured in the trade, in unlimited quantity; and in every degree of availability depending on different grades of solubility; and in the greatest variety of mixtures, so as to suit any whim or fancy of crop or crop grower.

2. That profitable crop growing can be carried on, for many years at least, with these commercial fertilizers alone.

3. That the most evident distinction between stable manure and commercial fertilizers, and the distinction upon which we should, therefore, naturally base an explanation of the greater reliability of the former, is its large proportion of vegetable matter, or humus-forming material; of which commercial fertilizers contain practically none.

4. That soils contain, in a difficultly soluble condition, and therefore not easily fed upon by the crops, large supplies of all the needed elements of plant food.

5. That humus, through its decay in the soil, furnishes carbonic acid, among other solvent agents; and this carbonic acid appears to play an important part in the nourishment of crops by bringing the native, insoluble stock of plant food within their easy reach.

6. That even if we add water-soluble plant food to the soil it becomes largely insoluble before the crop can feed upon it, or needs it; therefore soluble plant food added to the soil in commercial fertilizers needs also the help of the humus, finally, for its solution.

7. That plant food in most animal and vegetable residues used as manures costs much less than in commercial manures.

8. That, in spite of the disadvantages which, under some conditions, attend the use of commercial fertilizers, they are nevertheless a very important and necessary help in crop growing.

9. That in using these fertilizers the wisest course appears to be to make one's own mixtures of the raw materials, as well for securing a better manure as for economy in first cost.

Discussion.

Professor Caldwell said, in answer to an inquiry concerning his statement that soluble substances are rendered insoluble by being mixed with the soil, that the nitrogen of nitrogen compounds passes sooner or later into the form of nitrates, especially if the

soil is permeable to the air. The nitrates leach rapidly from the soil, while the other compounds of nitrogen are not so subject to waste from this cause, and the compounds of phosphoric acid and potash suffer scarcely any appreciable waste.

Hon. James J. H. Gregory was much pleased with the essay, which dealt with the fundamental points of fertilization, and brought in one rescuing fact, — that we can use commercial fertilizers to raise cow peas or clover, and can make humus by plowing these under. Barn manure is what has passed through the animal; the part of the food retained has become a portion of the animal, and manufacturers ultimately make fertilizers of him. Dung differs in its composition from the fertilizer made from the flesh and bones of the animal only in the fact that it is diluted with a larger quantity of water.

A. W. Cheever remarked that ploughing in green crops as fertilizers is practised more in the State of New York than here. A neighbor of his applied commercial fertilizers to a piece of ground, and sowed winter rye, which when nearly ready to blossom was ploughed in as a fertilizer for corn, but proved a failure. The speaker accounted for it by supposing that the rye had absorbed all the immediately available plant food, and did not decay soon enough to feed the corn.

Professor Caldwell thought Mr. Cheever's explanation probably correct. It would have been better to put on a crop later in the season.

William H. Bowker was much pleased with the essay, as well as with other writings by Professor Caldwell, and felt no fear that his occupation as a manufacturer of fertilizers was in danger. It made little difference to him whether he sold the materials of fertilizers for mixing, or mixed them to suit the wants of farmers. There must be a margin of profit, and formerly there was a greater profit on manufactured goods than there is now. It has cost a great deal to work up the use of fertilizers to the present point. No one not in the trade has any idea of the increase; and the speaker could not tell what it would come to in the future. He saw no way to procure the materials that will be wanted for fertilizers, especially nitrogen. He advised that farmers keep more stock and feed better, using artificial fertilizers only as supplementary to barnyard manure. They should study the feeding of animals in connection with feeding the soil. He recommended cotton-seed meal as feed for stock where rich manure is desired.

Mr. Gregory thought it well for farmers to buy the raw materials and do their own mixing. He had done so and knew the inside of the business. The margin which had been referred to as necessary was due to several causes: manufacturers have to hold their stocks two years; bags cost something; there is much waste, and agents are expensive, but we are indebted to them for stimulating farmers to purchase. We ought to allow a little leeway — say three or four dollars per ton. We have hardly done justice to the manufacturers and dealers, but have made them the target for complaint and abuse on account of failure.

Professor Caldwell thought there was a difference of eighteen or twenty per cent against mixed fertilizers as compared with the raw materials, estimating the latter at cash prices. Manufacturers sell on time.

William H. Hunt was pleased with the careful statements of the essay. The cost of stable manure was estimated at less than it costs here; it would be nearly one-half more here. He thought one of the greatest advantages in using artificial fertilizers is the ease with which they are applied in the growing season, when farmers are too busy to put on stable manure. They can be put on very rapidly. They have also a great advantage for remote fields, the expense of applying them being so much less than that of applying stable manure as often to make the practical difference between planting and not planting a crop. Fertilizers can, however, be used to the best advantage in connection with stable manures.

Samuel Hartwell was surprised at the low value placed on hen manure by Professor Caldwell. The New England Agricultural Society had lately held two elaborate discussions on poultry, and all considered the excrement a very valuable fertilizer; it was supposed to resemble guano. He buys horse and cow manure at the same price per cord, and, considering the greater weight of the latter, thinks it more valuable, cord for cord.

Professor Caldwell said that guano is the dried and concentrated dung of birds fed on fish, and is much richer in plant food than the ordinary droppings from fowls fed on grain.

Mr. Cheever asked Professor Caldwell's opinion as to the economy of attempting to improve lands by ploughing in green crops, either here or in New York. Can we afford to raise clover, rye, and other crops for ploughing in, with the supplemental use of

commercial fertilizers? He had taken the ground that it was bad management to do so; and preferred to feed the crops.

Professor Caldwell did not think green manuring an economical process: it takes time; and it is better to put the crop through the animal, where stock feeding is at all profitable. Animals retain only ten per cent of the food they consume. Clover would be least profitable of all crops to plough in, because it is so good for fodder; it is too good to plough in. When cut it leaves a great deal of fertilizing material in the stubble and roots, and is an excellent preparation for wheat. He advised the ploughing in of green crops only when they cannot be used for fodder. He did not pretend to stand here as a judge of manures; but the nitrogen in the hen manure did cost twenty-seven cents per pound. Ammonia in the form of sulphate or nitrate would have cost only twenty-two cents. There is a great difference in the quality of hen manure; some is taken better care of than others.

Mr. Bowker said he had heard a great deal of talk about applying the South Carolina phosphate directly to the soil in a finely ground state, without rendering it soluble, and asked Professor Caldwell's opinion of it.

Professor Caldwell replied that very few careful experiments had been made with the South Carolina phosphates. In Europe experiments have been made with such mineral phosphates as they have there, and the results have not been favorable; but those found in South Carolina are of better quality. Writers using the term "South Carolina phosphates" sometimes mean superphosphates made from them. Superphosphate containing phosphoric acid in a soluble or reverted state has a very great advantage over the mineral, in the ease with which it is dissolved and distributed in the soil.

Rev. A. B. Muzzey said that when in Europe some years ago he called on Thomas Carlyle in company with the Massachusetts Commissioner of Agriculture, and Mr. Carlyle said to them, "Two men I honor: him who cultivates the soil, and him who educates the human mind; — and no other." These two things are often united, as in these meetings; where we have a paper, followed by a discussion of the subject by practical men. He thought the Committee on Discussions deserved great credit for their sagacity in the selection of essayists — including one lady. However much we know, there is more and better yet to be told; but the informa-

tion elicited at these meetings proves that we are on the path of progress.

President Moore said that this was the thirteenth and last meeting of the series, and that the Society was much indebted to the Committee on Discussions, and especially to the Chairman, for their success. The meetings have improved year after year, the series now closed being the best of all.

The meeting then adjourned without day.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1885.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1886.

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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 4, 1885.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

William C. Strong, Chairman of the Committee appointed on the 7th of March to consider and report what amendments, if any, are necessary to the Constitution and By-Laws, read a report, which, after a second reading by the Secretary, was unanimously voted to be entered on the records for consideration at the quarterly meeting in July.

The report was as follows: —

MASSACHUSETTS HORTICULTURAL SOCIETY,
BOSTON, March 28, 1885.

The Committee appointed to consider the expediency of making any alterations in the Constitution and By-Laws of the Society, report, recommending the following alterations:

In Section III., in the sentence "An Executive Committee of four members," change "four" to "seven," so that the sentence shall read — "An Executive Committee of seven members."

In the sentence "A Committee of Arrangements of nine members," change "nine" to "three," so that it shall read — "A Committee of Arrangements of three members."

In Section XVI., erase the words "the Ex-Presidents" in the second line of the section, and change the number "four" in the third line to "seven," so that the sentence shall read as follows: "The Executive Committee shall consist of the President, who

shall be Chairman, the Chairman of the Finance Committee, and seven members chosen as provided in Section III."

Also, in the same section, in the sentence "And at such meetings five members shall be a quorum," change the number "five" to "four," so that the sentence shall read — "And at such meetings four members shall be a quorum."

Also, in Section XXIII., in the last line but one, change the number "nine" to "three," so that the section shall close reading as follows: "And three other members shall be chosen as provided in Section III., to superintend the same."

All of which is respectfully submitted.

W. C. Strong,
Edward L. Beard,
E. W. Wood,
Samuel Hartwell,
C. H. B. Breck,
} *Committee.*

Edward L. Beard, Chairman of the Committee of Arrangements, spoke of the Special Subscription Prizes for Hybrid Perpetual Roses offered for the last six years, and of the desirability of continuing them. No motion was made on this point, and consequently no formal action was taken; but the sense of the meeting appeared to be that the matter should be left with the Committee of Arrangements.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

Robert McMillan, of Whitinsville.
Mrs. James A. Gibbon, of Savin Hill, Boston.
Royal M. Pulsifer, of Auburndale.
George A. Parker, of Halifax.
George H. Peirce, of Concord.
George Cartwright, of Dedham.
Hon. George Heywood, of Concord.
E. W. Gilmore, of North Easton.
Charles J. Capen, of Dedham.
Philip Power, of Dedham.
Thomas B. Fitz, of West Newton.

Adjourned to Saturday, May 2.

BUSINESS MEETING.

SATURDAY, May 2, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

E. W. Wood, Chairman of the Committee appointed at the meeting on the 28th of March, to prepare a memorial of Hervey Davis, presented the following report: —

The Committee to prepare resolutions in memory of Hervey Davis would report the following:

Resolved, That the members of the Massachusetts Horticultural Society have learned with deep regret of the decease of their associate, Hervey Davis; and would place on record their recognition and grateful remembrance of faithful services rendered by him for many years. He was a member of the Fruit Committee for eleven years, and Chairman for four years of that time, and discharged the somewhat difficult duties of that position without fear or favor, — so far as possible doing justice to all exhibitors. His judgment was accurate, and his decisions were rarely questioned. He had made the culture of fruit a study, and was successful in producing the finest specimens, many of which were shown at our exhibitions.

Mr. Davis was also a member of the Executive Committee for four years, and brought to its deliberations the integrity and good judgment which characterized him in all the relations of life.

All the members of the Committee which presents this memorial were associated with him on the Fruit Committee, and had the best opportunity of knowing his worth. He will long be remembered as one of the most useful members of the Society.

E. W. WOOD,
BENJAMIN G. SMITH,
ROBERT MANNING,
} *Committee.*

Mr. Smith, of the Committee, spoke of the excellent judgment of Mr. Davis, and of his constant and prompt attendance at the meetings of the Fruit Committee.

President Moore expressed his concurrence with the resolutions, and with the remarks of Mr. Smith. He was for several years

associated with Mr. Davis on the Fruit Committee, and knew him to be a conscientious and truthful man, and of accurate judgment.

On motion of Joseph H. Woodford, it was unanimously voted that the report be accepted and recorded, and that a copy be sent to the family of Mr. Davis.

J. FRANK JOHNSON, of Boston,
having been recommended by the Executive Committee, was, on ballot, duly elected a member of the Society.

Adjourned to Saturday, June 6.

BUSINESS MEETING.

SATURDAY, June 6, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

C. H. B. Breck announced the decease of P. Brown Hovey, and moved the appointment of a Committee to prepare memorial resolutions. The motion was carried, and the chair appointed, as that Committee, Mr. Breck, Hon. Marshall P. Wilder, and William C. Strong.

The following named persons, with such as they might add, were appointed to represent the Society at the funeral of Mr. Hovey: Rev. A. B. Muzzey, Benjamin G. Smith, C. H. B. Breck, John G. Barker, George W. Fowle, E. W. Wood, Col. Henry W. Wilson, and Charles N. Brackett.

Hon. Marshall P. Wilder moved that a delegation be appointed to attend the Twentieth Session of the American Pomological Society, to be held in the state of Michigan next September, this delegation to consist of

The President, John B. Moore, *Chairman*.

Hon. Marshall P. Wilder,	E. W. Wood,
William C. Strong,	O. B. Hadwen,
Charles M. Hovey,	J. W. Manning,

Charles H. B. Breck,	Charles F. Curtis,
Benjamin G. Smith,	Warren Fenno,
Robert Manning,	William H. Spooner,
John C. Hovey,	Col. Henry W. Wilson,

and such others as the President may appoint.

[The name of Hon. Marshall P. Wilder, above entered, was added to the list by the President.]

The motion was seconded by William C. Strong, and carried unanimously.

Mr. Wilder then moved that the Society invite the American Pomological Society to meet in Boston in 1887, and provide suitable accommodation for the visiting society. This motion was referred to the Executive Committee.

On motion of Edward L. Beard, it was voted that the award of the prizes offered for Saturday, July 4, be postponed to July 11.

The following letter was read by the Treasurer:

BROOKLINE, May 28, 1885.

Mr. GEO. W. FOWLE:

DEAR SIR,—According to the will of the late Benjamin B. Davis: "To pay to the Massachusetts Horticultural Society the sum of five hundred dollars, and I direct that the sum be invested by said Society, and the income thereof appropriated for prizes for the best seedling grapes."

As this estate is being now settled, I write to inform you of the bequest, and to ask if you will conform to the conditions; and also if a check payable to your order will be right.

Yours respectfully,

MOSES WITHINGTON,
Executor of will of B. B. Davis.

It was voted that the bequest be accepted on the conditions above named.

The Secretary read a letter from the Special Committee of the General Union for the Promotion of the Cultivation of Bulbs, at Haarlem, under the patronage of His Majesty the King of the Netherlands, proposing to offer a first prize of a gold medal, a

second prize of a silver gilt medal, and a third prize of a silver medal, for the best fifty Hyacinths in fifty pots, to be competed for by nurserymen, seedsmen, and florists, at the Spring Exhibition of the Society in 1886.

It was voted to accept the proposition, and that the Secretary inform the Committee of the General Union, and that the subject be referred to the Committee on Establishing Prizes.

The Secretary also presented a letter from B. E. Fernow, Corresponding Secretary of the American Forestry Congress, asking the co-operation of the Society at the Annual Meeting of the Congress, to be held in Boston or vicinity in September next. The subject was referred to the Executive Committee.

Adjourned to Saturday, June 13.

BUSINESS MEETING.

SATURDAY, June 13, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

The Executive Committee, to whom was referred the proposition to invite the American Pomological Society to hold its meeting in Boston in 1887, reported in favor of extending such an invitation, and in accordance with the report it was voted to invite that Society to hold its twenty-first session in Boston; and to provide suitable accommodations therefor.

The Executive Committee also reported in favor of accepting the invitation of the American Forestry Congress to co-operate with it in its meeting in Boston in September next, which was referred to that Committee. The report was accepted, and Charles S. Sargent and John Robinson were appointed a Committee to confer with such Committee as might be appointed by the Forestry Congress in regard to the meeting.

Joseph H. Woodford presented the following vote:

Voted, That premiums not awarded on the date in the Schedule may, at the option of the Committee, be awarded on the next

exhibition day. After considerable discussion, the motion was laid on the table.

SAMUEL HOAR, of Concord, and
ELIHU G. LOOMIS, of Bedford,
having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 11, 1885.

A duly notified stated meeting of the Society was holden at 11 o'clock (the preceding Saturday having been a legal holiday), the President, JOHN B. MOORE, in the chair.

The Secretary stated that Charles S. Sargent and John Robinson, who were appointed a Committee to co-operate with the American Forestry Congress at its meeting in Boston, in September next, were obliged to decline on account of pressing engagements, and, the Forestry Congress being desirous to have the arrangements for the meeting made at an early day, the President, shortly after the last meeting of the Society, appointed William C. Strong, Benjamin G. Smith, and John E. Russell a Committee in their place. This action was confirmed by the Society, and on motion of William H. Spooner it was voted that a sum not exceeding one hundred dollars be appropriated for the expenses of the meeting. It was also voted that Mr. Spooner be added to the Committee.

C. H. B. Breck, Chairman of the Committee to prepare resolutions in memory of P. B. Hovey, reported the following:

Whereas, By the will of Almighty God, an esteemed and honored friend, associate, and co-laborer has been removed from the scenes of earth to a higher life; therefore

Resolved, That by the death of Mr. Phineas Brown Hovey, a member of the Massachusetts Horticultural Society from the first year of its existence, in 1829, — of which period he was a Vice-

President for five years, a member of the Fruit Committee twenty-four years, and Chairman of the Committee of Arrangements ten years,—the Society has lost a member who has faithfully and diligently fulfilled the duties required of him in the several positions he held, with honor to himself and for the best interests of the Society.

Resolved, That the members of the Society deeply deplore the death of this noble, generous, and kind-hearted man.

Resolved, That these resolutions be placed on the records of the Society, and a copy transmitted to the family of the deceased, with the assurance of the heartfelt sympathy of the members of the Massachusetts Horticultural Society.

CHARLES H. B. BRECK,
W. C. STRONG,
MARSHALL P. WILDER,
} *Committee.*

Mr. Breck added that it was his good fortune to be acquainted with Mr. Hovey more than forty years, and their relations were always the pleasantest. Mr. Hovey was an honorable and upright man, and a gentleman in every sense of the word.

Mr. Strong said that he joined very heartily in the resolutions. His acquaintance with Mr. Hovey was not as long as Mr. Breck's; but he was associated with him on the Fruit Committee, where he always found him careful and conscientious. The Society never had a member more faithful to it in all relations.

President Moore said there were only two members of the Society living who joined earlier than Mr. Hovey. It was his good fortune to make his acquaintance many years ago; and he was associated with him on the Fruit Committee, and he bore witness to the accuracy of Mr. Hovey's judgment. The annual exhibitions while Mr. Hovey was Chairman of the Committee of Arrangements were among the most prosperous held by the Society. He was an upright and honest man, and one of the most efficient members of the Society.

The resolutions were unanimously adopted by a rising vote.

The Amendments to the Constitution and By-Laws, proposed at the meeting on the 4th of April, and then ordered to be entered on the records, came up for final action, the vote being first taken on the part relating to the Executive Committee, which was unani-

mously adopted. The vote was then taken on the amendments relating to the Committee of Arrangements, which were also unanimously adopted.

On motion of Edward L. Beard, it was voted that the Committee on Establishing Prizes report on the first Saturday in August a list of prizes for Bulbs at the next Spring Exhibition.

It was also voted that the Executive Committee consider the subject of offering prizes for the best reports of Awarding Committees, agreeably to the rules of the State Board of Agriculture.

J. Wesley Barber, of Newton, and
Oliver Ditson, of Boston,

having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected.

Adjourned to Saturday, August 1.

BUSINESS MEETING.

Saturday, August 1, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, John B. Moore, in the chair.

E. W. Wood, Chairman of the Committee on Establishing Prizes, reported a list of prizes for bulbs at the exhibitions of the Society in February and March, 1886, which was accepted, and referred to the Committee on Publication.

The President, as Chairman of the Executive Committee, reported that that Committee had approved the appropriation of a sum not exceeding one hundred dollars for the expenses of the Committee on the meeting of the American Forestry Congress.

The President also reported, from the same Committee, a recommendation that the Society offer three prizes of $10, $8, and $6, for the best reports of Awarding Committees, agreeably to the rules of the State Board of Agriculture. The report was accepted, and it was voted that the prizes be offered.

The President appointed E. P. Richardson, Elijah H. Luke, and George Noyes additional delegates to the meeting of the American Pomological Society at Grand Rapids, Michigan, September 9–11.

It was voted that, on account of the funeral of General Grant occurring on Saturday, the 8th instant, the exhibition appointed for that day be held on Friday, the 7th.

The following named persons having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

WILLIAM R. CABOT, of Brookline,
L. W. GOODELL, of Amherst.

Agreeably to the Constitution and By-Laws, the President appointed the following Committee to nominate suitable candidates for the various offices of the Society for the ensuing year: E. W. Wood, *Chairman*, John C. Hovey, Charles N. Brackett, John G. Barker, C. H. B. Breck, George S. Harwood, F. L. Harris.

Adjourned to Saturday, September 5.

BUSINESS MEETING.

SATURDAY, September 5, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

E. W. Wood, Chairman of the Committee to nominate suitable candidates for officers and standing committees for the next year, reported a printed list, which was accepted.

It was voted that the Committee be continued, and requested to nominate candidates in place of any who might decline before the election.

Dr. Henry P. Walcott, Horace Eaton, Arthur W. Felton, Asa Clement, Samuel H. Pierce, N. B. White, and Henry L. Parker, were added to the delegates to the meeting of the American Pomological Society, at Grand Rapids, Michigan, September 9–11.

The Secretary presented, in behalf of M. Ch. Joly of Paris, a Corresponding Member of the Society, a portfolio of engravings and photographs of the International Horticultural Exposition, held in Paris in May last. The thanks of the Society were voted to M. Joly for this and other donations.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

GEORGE A. NICKERSON, of Dedham.
JOSEPH B. ROBINSON, of Allston.
ENOCH E. DORAN, of Brookline.

Adjourned to Saturday, September 19.

BUSINESS MEETING.

SATURDAY, September 19, 1885.

The meeting of September 5, having adjourned to this day, was called to order by the President, but no quorum was present and the meeting was dissolved.

BUSINESS MEETING.

SATURDAY, October 3, 1885.

A stated meeting of the Society, being the annual meeting for the choice of Officers and Standing Committees, was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

The Recording Secretary stated that the requirements of the Constitution and By-Laws, in regard to notice of the meeting, had been complied with.

The President stated that the business of electing officers would be first taken up, and, agreeably to the Constitution and By-Laws, appointed Robert T. Jackson, George Hill, and Cephas H. Brackett a Committee to receive, assort, and count the votes given, and report the number.

The polls were opened at ten minutes past eleven o'clock, and it was voted that they be kept open until one o'clock.

The following named persons having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

WILLIAM J. MARTIN, of Milton.
FRANK WYMAN, of Arlington.
JOHN FOTTLER, Jr., of Dorchester.
GEORGE B. CHASE, of Boston.

Edward L. Beard, Chairman of the Committee on Plants and Flowers, stated that the appropriation for gratuities to be awarded by that Committee was exhausted, and asked an additional appropriation of $150. The appropriation was voted, subject to the approval of the Executive Committee.

The polls were closed at one o'clock, and the Committee to receive, assort, and count the votes, retired, and after attending to that duty, reported

The whole number of votes to be . . .	224
Necessary for a choice	113

And the persons having the number necessary for a choice were, agreeably to the Constitution and By-Laws, declared by the presiding officer to have a majority of votes, and to be elected Officers and Standing Committees of the Society for the year 1886.

Adjourned to Saturday, November 7.

BUSINESS MEETING.

SATURDAY, November 7, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

The President, as Chairman of the Executive Committee, reported that that Committee had approved the additional appropriation of $150 voted at the last meeting for gratuities awarded by the Committee on Plants and Flowers.

The President also reported from the Executive Committee a recommendation that the Society appropriate the following amounts for prizes and gratuities for the year 1886:

For Plants and Flowers ($200 of this amount being for gratuities during the winter months),	$2,800
Fruits,	1,700
Vegetables,	1,000
Gardens,	200
Total,	$5,700

The report was accepted, and, agreeably to the Constitution and By-Laws, laid on the table until the first Saturday in January.

The Recording Secretary stated that four members had been elected to the Committee of Arrangements for 1886, instead of three as provided in the Constitution and By-Laws. The consideration of the subject was postponed to the December meeting.

The Secretary read an invitation from the California State Board of Agriculture to members of the Society to attend the Fifth Annual Convention of Fruit Growers, in connection with the meeting of the Board, at Los Angeles, commencing on the 16th of November and continuing a week or more. The thanks of the Society were voted for this invitation.

Edward L. Beard, Chairman of the Committee of Arrangements, spoke of the abuse of members' tickets of admission to the exhibitions, and offered the following vote: That a Special Committee of five be appointed to consider the expediency of revising Section XXVIII. of the Constitution and By-Laws, relating to this subject. The motion was carried, and the Chair appointed as that Committee: Mr. Beard, William C. Strong, E. W. Wood, Charles N. Brackett, and Henry W. Wilson.

On motion of George W. Fowle, Treasurer, the expediency of amending Section XXIX. of the Constitution and By-Laws, relating to the discontinuance of membership, was referred to the same Committee.

The following named persons, having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected:

EDWIN S. HILL, of Hyde Park.
JAMES C. MELVIN, of Newton.
Mrs. FRANCIS B. HAYES, Senior, of Lexington.
DAVID H. BROWN, of West Medford.
WILLIAM H. FORBES, of Jamaica Plain.
JONAS P. HAYWARD, of Ashby.
EDWARD FROST, of Littleton.
ALBERT BOWKER, of East Boston.

Adjourned to Saturday, December 5.

BUSINESS MEETING.

SATURDAY, December 5, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

The report of the Committee on the meeting of the American Forestry Congress was read by William C. Strong, Chairman.

The Annual Report of the Committee on Plants and Flowers was read by Edward L. Beard, Chairman.

The Annual Report of the Fruit Committee was read by E. W. Wood, Chairman.

The Annual Report of the Vegetable Committee was read by Charles N. Brackett, Chairman.

These reports were severally accepted and referred to the Committee on Publication.

Edward L. Beard, Chairman of the Committee appointed at the last meeting to consider the expediency of revising Sections XXVIII. and XXIX. of the Constitution and By-Laws, reported that no change was deemed necessary. The report was accepted.

William C. Strong announced the decease of Charles O. Whitmore, for many years Chairman of the Finance Committee; and moved the appointment of a Committee to prepare memorial

resolutions. The motion was carried, and the Chair appointed, as that Committee, Mr. Strong, Hon. Marshall P. Wilder, and William H. Spooner.

The President, as Chairman of the Executive Committee, presented the List of Prizes for the year 1886, agreed on by the Committee for Establishing Prizes, the same having been approved by the Executive Committee, and it was adopted by the Society.

It was voted that the Committee on Publication be requested to award the prizes offered for the best reports by the Committees on horticultural products and gardens.

The subject of one member in excess of the number prescribed by the Constitution and By-Laws having been elected to the Committee of Arrangements, — the consideration of which was postponed from the last meeting,—was taken up, and it was voted that the member having the smallest number of votes be dropped from the Committee.

The following named persons, having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected:

C. De Kay Townsend, of Melrose.
George H. Rogers, of Waltham.
Avery W. Nelson, of Somerville.

Adjourned to Saturday, December 12.

BUSINESS MEETING.

Saturday, December 12, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, John B. Moore, in the chair.

The Annual Report of the Library Committee was read by William E. Endicott, Chairman, accepted, and referred to the Committee on Publication.

William C. Strong, Chairman of a Committee appointed, at the Meeting for Discussion on the 14th of March, to consider the subject of a reform in the nomenclature of garden plants, reported that the Committee had noticed many instances where they would recommend changes, but refrained from specifying them, as the work must be progressive; but they recommended the passage of the following vote:

Voted, That the Committee on Establishing Prizes, in making up the Prize Schedule of the Society, adhere as closely as possible to the rules for the simplification of the names of fruits adopted by the American Pomological Society; and apply the same principles to the names of plants, flowers, and vegetables; and that the Committee on Publication pursue the same course in the TRANSACTIONS. Also that a record of all such changes be kept and submitted to the Society for its approval.

The report was accepted, and the vote was passed.

The Chairman of the Committee on Gardens asked further time to prepare his report, which was granted.

Robert Manning, Secretary and Librarian, read his annual report, which was accepted, and referred to the Committee on Publication.

Edward L. Beard, Chairman of the Committee of Arrangements, moved that there be printed on the members' tickets to the various exhibitions, instead of the words "Not Transferable," the following words: "This ticket can be used only by the member named on it and his immediate family, and if lent or transferred will be taken up." The motion was unanimously carried.

The Treasurer called attention to the large amount of assessments due from Annual Members of the Society; and it was *Voted*, That the Treasurer be directed to enforce strictly the provisions of Section XXIX. of the Constitution and By-Laws, first giving reasonable notice to such members as are now delinquent.

Also, that the Treasurer give notice to all persons who have been elected to membership, but have not paid their admission fees, to do so promptly or their names will be dropped.

Adjourned to Saturday, December 26.

BUSINESS MEETING.

SATURDAY, December 26, 1885.

An adjourned meeting of the Society was holden at 11 o'clock, the President, JOHN B. MOORE, in the chair.

William C. Strong, Chairman of the Committee appointed December 5th to prepare resolutions in memory of Charles O. Whitmore, presented the following report: —

The Committee appointed to express the regard of the Society for the late Charles O. Whitmore, report as follows:

In view of the decease of Charles O. Whitmore, Esq., the Massachusetts Horticultural Society desires gratefully to record its deep sense of indebtedness for his long, faithful, and able services as Chairman of its Committee on Finance, and also in other important offices of the Society. His untiring zeal in promoting the welfare of the Society will ever be held in thankful remembrance.

The Society also extends to the family of the deceased its sincere sympathy in their present sorrow.

WILLIAM C. STRONG,
MARSHALL P. WILDER,
WILLIAM H. SPOONER,
} *Committee.*

Mr. Strong added that he regretted the absence of Hon. Marshall P. Wilder, a member of the Committee, who had been long and intimately acquainted with Mr. Whitmore, and who was competent to speak of him as few of his friends could. Mr. Whitmore was a member of the Committee to procure a site for a new hall for the Society, and also of the Committee to erect a building. He was fully impressed with the belief that this site, fronting on a main street and bounded by two side streets, was the most eligible to be found, and was extremely persistent in his efforts to secure it; and but for these efforts it is very doubtful whether we should have acquired this land and building. Though he had engaged in practical horticulture only to a small extent, he felt that without the benign influences of the cultivation of nature men would grow up in heathen darkness.

Robert Manning said that, excepting the predecessor of the present Treasurer of the Society, no one had a better opportunity than himself to know of the assiduous and constant care with which Mr. Whitmore watched over the finances of the Society during the time he was Chairman of the Finance Committee. He took pleasure in testifying to Mr. Whitmore's devotion to these and all other interests of the Society.

Benjamin G. Smith said that the members acquainted with Mr. Whitmore would always hold his memory in grateful remembrance. He spoke of an interview which he, as a member of the Nominating Committee, had with Mr. Whitmore in regard to the use of his name as a candidate for the office of President, but, though he would undoubtedly have been elected, Mr. Whitmore declined to be a candidate.

William H. Spooner said that Mr. Whitmore's connection with the purchase of the land and erection of the Society's building should be strongly emphasized. He was opposed to the movement to secure land on the Back Bay, believing a more central site preferable; and to him, and also to the late Edward S. Rand, we are largely indebted for securing this location.

President Moore said that in all probability we should not have had this hall but for the efforts of Mr. Whitmore. He was always affable, and had no selfish interest in view in serving the Society. He might at various times have been President if he had accepted the nomination.

The resolutions were unanimously passed.

Edward L. Beard, Chairman of the Committee of Arrangements, read the Annual Report of that Committee. Mr. Beard said that in presenting this report he felt very great gratification at the increased interest in the exhibitions, which afforded encouragement to hope for a further increase. If it had been prophesied beforehand that the receipts from the four paying exhibitions would increase in a few years from $600 to $3,600, it would not have been believed; but the increase of last year over the preceding year was equal to the whole average receipts for the last ten years. There is no reason why we should be limited by the present possibilities around us, and he hoped for a still further increase in the future.

The report was accepted, and referred to the Committee on Publication.

John G. Barker, Chairman of the Committee on Gardens, read the Annual Report of that Committee. Accepted, and referred to the Committee on Publication.

The President, as Chairman of the Executive Committee, reported from that Committee a recommendation that the Society make the following appropriations:

For the Library Committee, for the purchase of magazines and newspapers, binding of books, and incidental expenses of the Committee, . .	$300 00
For the same Committee, to continue the Card Catalogue of Plates, ...	100 00
For the Committee on Publication and Discussion, .	250 00
For the Garden Committee, for Prizes (additional to the $200 recommended November 7), . .	100 00
For the Committee of Arrangements, to cover the deficiency for the years 1884 and 1885, . .	94 80

The Executive Committee also recommended that an appropriation of $300 be made for the use of the Committee of Arrangements for 1886, this sum to cover all extraordinary expenses of said Committee.

Agreeably to the Constitution and By-Laws, the above recommendations were laid over until the stated meeting in January.

The President further reported, that the Executive Committee had approved the offer of the Special Prospective Prize for Seedling Native Grapes, from the fund established by the late Benjamin B. Davis.

Also, that the Executive Committee had appointed George W. Fowle Treasurer of the Society and Superintendent of the Building, and Robert Manning Secretary and Librarian, for the year 1886.

The Librarian laid before the Society several books by William Paul, of Waltham Cross, England, a Corresponding Member of the Society, and presented by him to the Library. The thanks of the Society were voted to Mr. Paul for this donation; and also to himself and his son, Mr. Arthur W. Paul, for services kindly rendered to the Society.

On motion of Joseph H. Woodford, Chairman *elect* of the Committee on Plants and Flowers, it was *Voted*, That blank entry-papers be furnished to exhibitors for the entry of Plants and Flowers at the large exhibitions of the Society. These entry-papers to be prepared by the Committee of Arrangements, and to be sent to exhibitors with an explanatory letter stating the object to be attained.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1885.

By EDWARD L. BEARD, Chairman.

As anticipated at the beginning of this year, the increase of prizes offered by the Society for 1885 has led to a marked improvement in the competition for them by exhibitors of Plants and Flowers; though a large number of the prizes were not competed for. This absence of competition was noticeable where the Schedule called for specimens of such flowering or other plants as require time and skill for their preparation. Since the stimulation of cultural skill among gardeners—professional or amateur—is one of the leading objects of this Society, it is to be regretted that there is not a more general rivalry among exhibitors in competing for such prizes in the Schedule as are offered for specimens of either hard or soft wooded, and of hardy or greenhouse plants. These prizes should be made still more liberal, at the expense of mere displays of cut flowers or flowers from the open garden, which in many cases do not call for any especial skill in culture.

The classes for specimen Azaleas, Pelargoniums (both Fancy and Zonale), Heaths, Forced Hardy and Herbaceous Plants, Stove and Greenhouse Flowering Plants, and Hydrangeas in pots, were meagrely represented, there being in many cases no entries whatsoever. In the various classes for Specimen Chrysanthemums in pots there were but two exhibitors, and these did not attempt to compete for all the prizes offered for trained plants where cultural skill was a requisite. In a community where there are numerous plant growers of acknowledged skill, this Society ought to encourage more active competition among them, in place of fostering the displays of cut flowers, which, though attractive in a degree,

do not properly exemplify the higher aims which the Society has in view.

The first informal exhibition of the Society was held on January 10th, when there was a good display of Cut Flowers, etc., and one of Native Perennials and Mosses by Mrs. P. D. Richards. This exhibitor,—who confines herself to showing the wild flowers, ferns, and mosses, indigenous to this section,—has made some of the most valuable and interesting exhibits ever noticed in our records. Every wild plant and flower, moss and fern, has been gathered in its season, at no inconsiderable expenditure of time and trouble, and exhibited not only with the botanical name but the popular English or local name appended. This has proved very instructive to thousands, and cannot be too highly commended.

On the 24th of January, S. R. Payson exhibited some magnificent specimens of *Cattleya Trianæ*, and the newer *Cattleya labiata Percivaliana*, one of the most promising of the few autumn blooming Cattleyas. One of the finest varieties ever shown of this species was among the number, and the collection was awarded a Silver Medal.

On the 31st of January, F. L. Ames brought in the new and very rare *Vanda Sanderiana*. This magnificent orchid bore a five-flowered spike, and had never been shown in bloom in this country. It received a Silver Medal.

On the 28th of February a First Class Certificate of Merit was awarded to William H. Spooner for blooms of the new English-raised Hybrid Perpetual rose, Queen of Queens, one of the whitish-pink class. It is a fine large rose, and promises to be hardy, though its qualities as a good grower are yet but indefinitely known.

The new Japanese *Primula obconica* was exhibited the same day. This is one of the best dwarf plants for winter blooming in the greenhouse ever introduced, and its rosy white blooms are persistent. It is perennial in its character, and throws up truss after truss of bloom the entire winter and far into summer. It was awarded a First Class Certificate of Merit.

E. M. Wood & Co., on the same day, offered a lot of sixteen blooms of Maréchal Niel Roses, similar to those shown by them at other times, which represented the perfection of culture; and no other exhibitor, with the exception of N. G. Simpkins, was able to divide honors with them. A Bronze Medal for cultural skill was awarded.

The cut blooms of Hybrid Perpetual Roses, shown by John B. Moore & Son on this and other dates, were rather better than the average of these noted growers, and but one lot of early forced Hybrid Roses could compete with them. This was shown by L. W. Hastings, on the 17th of March. On this day, Henry Ross exhibited *Xanthoceras sorbifolia*, a beautiful shrub, which is of doubtful hardiness in this latitude.

SPRING EXHIBITION.

March 19 and 20.

This exhibition was held under the serious disadvantage of excessively and unseasonably cold weather, so that exhibitors of Azaleas and other large plants were not as numerous as usual, but this was fully offset by the glorious display of Spring Bulbs and Orchids. It is not extravagant to say that no such exhibit was ever made in this country before, and the stimulus given by it to bulb culture can hardly be estimated.

Arthur W. Blake, a new exhibitor, was first for six Azaleas, which, though small, were well grown and bloomed, and included some of the newest and most brilliant varieties, Flambeau being exceptionally good. Mr. Blake was first for four Azaleas and for a single Azalea, while Hon. Marshall P. Wilder was first for a specimen Azalea.

Jackson Dawson took the first prize for a single plant of Hybrid Perpetual Rose with Abel Carrière, and Mrs. Francis B. Hayes took the second with Emily Laxton.

There were no entries for the four prizes for twelve blooms of Gen. Jacqueminot Rose.

The display of Tea Roses was fairly good: Catherine Mermet, Bon Silène, Cornelia Cook, and Niphetos being well shown by Delay & Meade, Edwin Sheppard, and C. M. Hovey.

John L. Gardner took the first prize for twelve single Hyacinths in pots. In this lot were

Alba Maxima,
Argus,
Charles Dickens,
La Grandesse,
La Tour d' Auvergne,
Laurens Koster,
L' Incomparable,
Obelisque,
Princess Dagmar,
Sir John Lawrence,
Snowball.

C. M. Hovey took the first prize for six Hyacinths in pots with

Amy,	Fabiola,
Baroness Van Tuyll,	King of the Blues,
Charles Dickens,	Mimosa.

C. H. Hovey & Co. took the first prize for three Hyacinths with Paix de l' Europe, Lord Palmerston, and Veronica; and also the first prize for a single Hyacinth, with Czar Peter. Messrs. Gardner and C. H. Hovey & Co. had some well grown Hyacinths in pans, which is a very effective method of showing this beautiful spring flower.

While the Hyacinths were particularly good, the Tulips were poor. Hardy Narcissi were well shown, prominent among them being the new Welsh Daffodil, Sir Watkin, a form of *N. incomparabilis*. This is distinct and fine enough to take rank with Emperor, Empress, and Horsfieldii, and is quite hardy. It was shown by E. L. Beard, who also staged some fine forms of *Cyclamen persicum*, quite in advance of the old types of this charming flower. This is a plant which is not generally well grown, but which is worth all the attention it requires.

The prizes for a General Display of Spring Bulbs were effective in bringing out good collections; the first prize being taken by C. M. Hovey. Among the Narcissi shown, were *N. obvallaris* (the Tenby Daffodil) and *Bulbocodium album*, both gems. The Tenby Daffodil is hardy, the other is not.

Denys Zirngiebel exhibited a large collection of cut blooms of Pansies in dishes, taking all of the prizes. They were a superb lot of fancy and show varieties, with firm petals, and well up to the standard of a perfect Pansy.

No Forced Hardy or Herbaceous Plants in pots were shown, which was unfortunate in view of the opportunities for effective display in this class.

The first prize for a specimen Greenhouse Plant was taken by John L. Gardner, who exhibited *Imantophyllum miniatum*; Mrs. Francis B. Hayes was second in this class, with a fine plant of *Rhododendron Veitchianum lævigatum*.

Carnations were finely shown by J. A. Foster, whose collection of long stemmed blooms was tastefully arranged with the foliage, and took the first prize. Cinerarias and Camellias were well represented.

The exhibition of Orchids was the best ever made, comprising over one hundred plants, many of them unique specimens.

F. L. Ames exhibited

Cattleya amethystoglossa.

Dendrobium Ainsworthii, with over 150 flowers.

" *Brymerianum.*

" *Wardianum;* several large plants.

" " *album.*

Odontoglossum Alexandræ, and

" *Pescatorei;* several magnificent plants, one of the latter bearing sixty flowers on one spike.

Odontoglossum triumphans, with an unequalled spike of bloom.

Phalænopsis Brymerianum.

" *Stuartiana.*

And many others of large size and rare quality.

H. H. Hunnewell exhibited

Calanthe Turneri.

Cœlogyne cristata, the Chatsworth variety; a plant three feet across, and a sheet of flowers.

Cymbidium Lowi.

Dendrobium Wardianum, a fine plant.

Odontoglossum Insleayi.

Phalænopsis Schilleriana. Several extra good varieties were shown, one plant having about seventy-five flowers open.

Sophronites grandiflora.

Besides numbers of others.

David Allan (gardener to Robert M. Pratt) exhibited

Cypripedium insigne, one of the finest plants of this species ever put on exhibition. It was about four feet across.

Dendrobium Ainsworthii, a well-bloomed plant.

" *Wardianum*, about a dozen grand plants, most of them bearing from forty to sixty flowers.

All of the Orchids were interspersed with ferns and brilliant Anthuriums, constituting such a display as is rarely witnessed. A gratifying feature of the exhibition was the award of the Society's Silver Medal to F. L. Harris (gardener to H. H. Hunnewell), David Allan (gardener to Robert M. Pratt), and W. Robinson

(gardener to F. L. Ames), for skilful culture of Orchids. The Botanic Garden at Cambridge, through W. A. Manda, its gardener, exhibited forced herbaceous plants, including *Lilium tenuifolium*, *Primula cortusoides*, *Trillium grandiflorum*, and *Doronicum Caucasicum*, the last very bright and showy. Jackson Dawson of the Arnold Arboretum showed fine and well bloomed plants of Hybrid Perpetual Roses on the Japanese stock, taking the first prize for three; and an interesting collection of hardy Primulas and Polyanthuses in pots, besides forced *Kalmia latifolia*. John B. Moore & Son took the first prize for twenty-four cut blooms of Hybrid Perpetual Roses, which were even finer than his magnificent June flowers that for three years have taken the Challenge Vase. A magnificent bloom of White Baroness took the first prize for single bloom. This promises to be a finer rose than the Merveille de Lyon. Messrs. Moore exhibited a plant of the new Hybrid Perpetual rose, Col. Felix Breton. This is the darkest rose ever shown, of good habit, promising well for freedom of bloom, and very fragrant. It was awarded a First Class Certificate of Merit.

On the 11th of April, F. L. Ames exhibited the new hybrid *Lælia Philbrickiana*, which received a First Class Certificate of Merit. He also had a collection of remarkable Orchids, comprising eight plants of *Odontoglossum Pescatorei*, all of them fine varieties; and many other rare and brilliant species.

On the 18th of April, forty-two gigantic flowers of Cornelia Cook and Catherine Mermet roses were shown by N. G. Simpkins, and nothing finer could be imagined.

MAY EXHIBITION.

May 9.

The collection of Pelargoniums at this exhibition was meagre, no entries for Zonale or Fancy varieties having been made. This exhibition has not been successful for several seasons. There was no competition for Calceolarias in pots; and very few of the prizes offered were taken.

A fine lot of Auriculas, in pots, was shown by David Allan.

RHODODENDRON SHOW.

JUNE 6.

At this exhibition, the only entry for the Hunnewell premiums was made by Mrs. Francis B. Hayes, who took the first prizes for twenty-four, twelve, six, three, and single tender varieties of Rhododendrons. The six tender varieties taking the first prize were

Baron Schroeder.	Lady Grenville,
Jennie Deans,	Lady Rolle,
John Walter,	W. E. Gladstone.

The varieties taking the first prize for three, were Auguste Van Geert, Lady Dorothy Neville, and Mrs. Thomas Longman.

There were no entries for Hardy Rhododendrons except in the class for six. The first prize in this class also was taken by Mrs. Hayes.

There was no competition for Hardy Azaleas.

H. H. Hunnewell had a large and very fine exhibit, of forty-two varieties of Rhododendrons, thirty Ghent Azaleas, twelve varieties of *Azalea mollis*, and sixty varieties of Indian Azaleas — not for competition.

On the 13th of June the exhibition of Rhododendrons was better than on the regular prize day, Mrs. Hayes contributing some new and strikingly beautiful varieties, some of the best of which were

Baron Schroeder,	Lady Rolle,
B. W. Currie,	Minnie,
Concessum,	Mrs. Heywood,
Duchess of Connaught,	Mrs. Tretton,
Duke of Connaught,	Mrs. W. Agnew,
Exquisite.	Mrs. Williams,
Fleur de Marie,	Sappho,
Francis B. Hayes,	Sir Arthur Guinness,
Helen Waterer,	Sir Colin Campbell,
Jack Waterer,	Sir James Clark,
James Mason,	Sir Joseph Whitworth,
Lady Clement,	Surprise,
Lady Falmouth,	W. H. Punchard.

Mr. Hunnewell also staged a large lot of Rhododendrons and Azaleas.

On the 20th of June, Mrs. Hayes again exhibited new varieties of Rhododendrons, fifteen in number; and was awarded a Silver Medal for them. The colors of these were if possible even more delicate and novel than those shown by her before. Among them were the following which were noted as the finest:

Baroness Schroeder,
Charles Noble,
Mabel Mears,
Maggie Heywood,
Sir Humphrey de Trafford,
Snowflake,
Souvenir de Prince d'Orange,
Vauban,
Village Maid,
Vivian Grey.

ROSE AND STRAWBERRY EXHIBITION.

June 25 and 26.

This was not quite up to the average excellence of former exhibitions, the weather proving uncertain and unfavorable.

Subscription Prizes for Hybrid Perpetual Roses.

There was sharp competition for these; John B. Moore & Son taking that for twenty-four varieties, one of each, with the following, all in the finest form and condition:

Abel Carrière,
Alfred Colomb,
Baroness Rothschild,
Charles Lefebvre,
Étienne Levet,
E. Y. Teas,
François Michelon,
George Moreau,
Horace Vernet,
La Rosière,
Mabel Morrison,
Marguerite de Roman,
Marguerite de St. Amande,
Marquise de Castellane,
Merveille de Lyon,
Mme. Eugénie Verdier,
" Gabriel Luizet,
" Marie Rady,
" Victor Verdier,
Pierre Notting,
Queen of Queens,
Sir Garnet Wolseley,
Ulrich Brunner,
Victor Verdier.

Messrs. Moore also took the prize for eighteen varieties, one of each.

David Allan took the special prizes for twelve and four varieties, three of each; and John S. Richards that for six varieties.

John L. Gardner took the Amateur's Prize for twenty-four different varieties, and the prizes for six of any two varieties, and eighteen of different varieties.

SOCIETY'S PRIZES.

John B. Moore & Son were first in the competition for the Society's Prizes for Hybrid Perpetual Roses, with the exception of the classes for six named varieties, three of each, and three named varieties, three of each; the first prizes for these going to John S. Richards. The first prize for Moss Roses, in both classes, went to John B. Moore & Son.

The lack of competition for the Society's prizes indicates that the classes are too large, few exhibitors having Roses enough to fill a class where three each of twenty-four varieties are required.

The general display of Roses was fine; and exhibitors generally were prompt in renewing their boxes and collections on the second day of the exhibition.

There was no competition for the prizes for Stove and Greenhouse Flowering Plants; but the show of Orchids was notably good. F. L. Ames took the first prize for twelve, and also for six varieties. In his collection, were

Cattleya Gaskelliana,		*Odontoglossum*	*Alexandræ*,
Cypripedium albo-purpureum,		"	*Cobbianum*,
"	*ciliare*,	"	*maculatum*,
Masdevallia Harryana magnifica,		"	*Pescatorei*,
		"	*vexillarium*.

David Allan (gardener to R. M. Pratt) and E. W. Gilmore had fine collections of Orchids; the former taking the second prize for twelve plants, and the latter the first for three.

A First Class Certificate of Merit was awarded to F. L. Ames for the new variegated Stove Plant *Leea amabilis*, a very promising species.

All of the classes for Cut Flowers were well represented except that for Herbaceous Pæonies.

THE SATURDAY EXHIBITIONS through the summer were up to the average in quality, and attracted more than ordinary attention.

Iris Kæmpferi was well shown by John L. Gardner on the 11th of July; and it is hoped that more attention will be paid to the cultivation of this beautiful species of Iris.

Hollyhocks were well shown on the 18th of July; though they would be far more attractive if exhibited on the stalks, and not in flat dishes where their beauty is completely lost. E. Sheppard took the first prize for twelve, and Edwin Fewkes the first for six.

Not a prize for Hydrangeas on the 25th of July was taken; nor for *Lilium longiflorum*. The latter is, in many cases, not proving hardy; and its out-door culture has been very much reduced. The first prizes for Sweet Peas and Verbenas went to Edwin Fewkes and A. A. Hixon, respectively.

Stocks and Balsams were poorly represented on the 1st of August; there being no entry in the former class, and but one in the latter.

F. L. Temple exhibited *Hypericum aureum* and *Gaillardia grandiflora*, both of which received First Class Certificates of Merit. A similar Certificate was awarded to Edwin Fewkes for *Milla biflora*, which, treated in the same manner as the gladiolus, is one of the finest white flowered bulbs for the garden yet introduced. A First Class Certificate of Merit was awarded to John C. Hovey for *Orostachys spinosa*.

John B. Moore & Son took the first prize for Perennial Phloxes on the 8th of August; and the first prize for Petunias went to A. A. Hixon.

William Martin (gardener to Henry P. Kidder), exhibited some splendid specimens of Achimenes in pots, and received a First Class Certificate of Merit.

James Cartwright took the first prize for twenty varieties of Gladioli on the 15th of August; and the first for one spike, the variety being Ambrose Verschaffelt. Mr. Cartwright was also first for the General Display. The quality of the Gladioli, in general, was good; and this exhibition was a fine one. Denys Zirngiebel exhibited eight pots of his Seedling White Aster, and received a First Class Certificate of Merit. Grown in this way, the Aster becomes highly decorative for conservatories or dwellings.

Edwin Sheppard took the first prize for Truffaut's Asters on the 22d, Warren Heustis the second; and Mr. Sheppard was first for Victoria Asters. L. W. Goodell took the first prize for Pompons.

At this exhibition, E. H. Hitchings had *Utricularia clandestina*, not shown before. A Silver Medal was awarded to N. S. Simpkins for splendid specimens of *Nymphæa rubra*, *N. Devoniensis*, *N. Zanzibarensis aurea*, and *N. dentata*.

There was a slim show of *Lilium lancifolium* and Tropæolums, on the 29th; but a good lot of Marigolds was shown by S. S. Hovey, taking the first prize.

V. H. Hallock, Son, & Thorpe, of Queens, N.Y., exhibited nine varieties of Gladioli, seedlings from *Saundersii*, all showing the characteristics of that species; but all highly decorative and brilliant in color, yet not up to the standard of a first class Gladiolus as to spike and shape of flowers.

A good exhibit of Dianthus was made on the 5th of September, the first prize going to L. W. Goodell, who has been very successful in improving this flower.

Joseph Tailby exhibited a plant in bloom of the new Tea Rose, William Francis Bennett, for which a First Class Certificate of Merit was awarded. This rose can never take the place of the Gen. Jacqueminot as it has been claimed it would do. It is almost as single as Safrano, and though handsome and well colored in the bud state, soon opens and has a tendency to fade. As a rose to be used only while unopened, it will no doubt prove valuable, particularly if free in blooming. A First Class Certificate of Merit was awarded to C. M. Hovey for Tea Rose Perle d'Or, and one to Edwin Fewkes for Heliotrope Roi des Noirs. This is certainly the darkest heliotrope known, but lacks that fragrance possessed by other varieties.

ANNUAL EXHIBITION.

September 15, 16, 17, and 18.

This was, so far as comparison can go, the best, in most respects, ever held by the Society. It served to demonstrate, however, that this exhibition has outgrown the halls. In the five thousand square feet of the upper hall alone, enough plants were grouped to fill effectively double the space.

Evergreen Trees and Shrubs.—William C. Strong took the first Hunnewell premium for these.

Stove and Greenhouse Plants.—H. H. Hunnewell took the first prize for ten, though it was very difficult to decide between this lot and S. R. Payson's. The successful collection comprised

Alocasia macrorhiza var.,
Anthurium crystallinum,
Cissus discolor,
Croton fasciatus,
Cycas circinalis,
Ficus Parcelli,
Licuala grandis,
Maranta virginalis,
Phyllotœnium Lindeni,
Sphœrogyne latifolia.

SPECIMEN FLOWERING PLANTS.—David Allan (gardener to R. M. Pratt) was first for six in bloom, as follows:

Allamanda Schottii,	*Ixora Westii*,
Curcuma Roscoeana,	*Nerine coruscans*,
Dipladenia profusa,	*Vallota purpurea.*

The plant of *Anthurium Andreanum* shown by David Allan took the first prize for a single specimen in this class.

VARIEGATED LEAVED PLANTS (other than Crotons or Dracænas).—Mr. Hunnewell was first for six, as follows:

Alocasia Thibautiana,	*Dieffenbachia magnifica*,
Bertolonia Van Houttei,	*Maranta fasciata*,
Dieffenbachia Bausei,	" *rosea picta.*

G. A. Nickerson took the first prize for a single specimen, with the finest colored Croton Queen Victoria ever shown in the hall.

CALADIUMS.—F. L. Ames was first for four as follows:

Candidum,	John R. Box,
Duchess of Teck,	Mad. Fritz Kœchlin.

FERNS.—The first prize for six was taken by F. L. Ames, with the following named plants:

Davallia Mooreana,	*Microlepia hirta cristata*,
Gleichenia dicarpa,	*Nephrolepis davallioides furcans*,
" *dichotoma*,	*Polypodium plumosum.*

ADIANTUMS.—David Allan was first for six, as follows:

A. concinnum,	*A. gracillimum*,
A. cuneatum,	*A. Matthewsiana*,
A. Farleyense,	*A. Williamsii.*

LYCOPODS.—Here also Mr. Allan was first with

L. cæsium,	*L. hæmatodes*,
L. densum,	*L. variabilis.*

DRACÆNAS.—The first prize for six was taken by H. H. Hunnewell, who had the following, all finely grown and colored:

D. Bella,	*D. Mr. Hunnewell*,
D. Harrisii,	*D. Sheppardi*,
D. Lindeni,	*D. Youngii.*

CROTONS. — F. L. Ames was first for six, with the following varieties:

Baron Frank Selliere,	Mortefontainensis,
Dayspring,	Mortii,
Disraeli,	Nevilliæ.

PALM. — The magnificent plant of *Cocos Bonnetti* shown by S. R. Payson took the first prize for a specimen palm.

In NEPENTHES, F. L. Ames was first with *Chelsoni*, *hybrida maculata*, and *splendida*.

ORCHIDS. — The first prize for six went to F. L. Ames, who had

Cœlogyne Cummingii,	*Dendrobium formosum*,
" *Massangeana*,	" *Lowii*,
Cypripedium Veitchii,	*Oncidium incurvum*.

For three Orchids E. W. Gilmore was first, with *Dendrobium formosum giganteum*, *Saccolabium Blumei majus*, and *Oncidium incurvum*. The prize for a single Orchid went to F. L. Ames for *Epidendrum prismatocarpum*.

CUT FLOWERS. — The display of Gladioli, Dahlias, and other cut flowers, was very bright and well kept up during the exhibition.

A Silver Medal was awarded to David Allan for *Alocasia Sanderiana*, and one to H. H. Hunnewell for *Asparagus plumosus scandens*.

The platform of Greenhouse and Stove Plants shown by William J. Martin (gardener to Henry P. Kidder), was deservedly admired; the specimens of Fuchsias in flower especially giving evidence of Mr. Martin's skill; while the whole lot was well grown and admirably arranged.

The tank of Nymphæas and Nelumbiums from Edward D. Sturtevant, of Bordentown, N. J., was exceedingly attractive. N. S. Simpkins also exhibited fine flowers of Nymphæas in the same tank.

A very noticeable new plant, *Ataccia cristata*, remarkable however only for its rarity and weird form, was exhibited by F. L. Ames. It was given a First Class Certificate of Merit.

On the 7th of November an especially good plant of *Helleborus niger*, in a pot, was shown by John C. Hovey, bearing probably

fifty pure white flowers. It had been lifted from the open ground, and the earliness of its bloom under those conditions was surprising. This ought to become one of the most valuable plants for winter forcing.

CHRYSANTHEMUM SHOW.

November 12 and 13.

The annual exhibition of Chrysanthemums was in many respects the most successful ever given in Boston; though the competition was not what it should have been, some of the strongest growers of Chrysanthemums being wholly unrepresented.

The upper hall of the Society, comprising five thousand square feet, was devoted to Chrysanthemums in pots and the Orchid display; while the lower hall was given over to cut blooms, and fruit and vegetables. Even both of these large halls were inadequate to hold the aggregated collections.

The first prize for six Chinese Chrysanthemums was taken by Dr. H. P. Walcott, with the following varieties:

Baron Beust,	Mrs. Forsythe,
Bruce Finlay,	Mrs. Sharp,
King of Crimsons,	Mrs. Shipman.

These were magnificent plants, in twelve-inch pots, grown naturally, the blooms not tied down, and each plant between four and five feet high,— averaging five feet across. The same rating applied to all the plants exhibited by Dr. Walcott, which in respect of growth, were admitted to be the best ever shown in one lot in this country.

Dr. Walcott was also first for three Chinese: Mrs. Dixon, Christine, and Alfred Salter. He was also first for six Japanese, with glorious plants of

Bouquet Fait,	La Charmeuse,
Flambeau,	Nevada,
Golden Dragon,	President Parkman.

For three Japanese, Dr. Walcott came first, with Fair Maid of Guernsey, Moussillac, and Belle Valantinan.

For four Pompons, Dr. Walcott was first with

Golden Mdlle. Marthe,	Mdlle. Marthe,
La Vogue,	Salamon.

Dr. Walcott took the first prize for a specimen Chinese Chrysanthemum, with Gladstone, and the first prize for a specimen Japanese Chrysanthemum, with Fernand Feral. His only competitor in these classes was a new grower, Edwin Fewkes, whose plants, while smaller, were yet well grown and very clean and perfectly flowered. He took all the second prizes for specimens.

The first prize for forty specimens, not less than ten varieties, was awarded to E. W. Wood, who staged handsome plants of the following:

Annis,
Bouquet Fait,
Citronella,
Damio,
Dr. Sharpe,
Elaine,
Fremy,
Fair Maid of Guernsey,
Golden Circle,
Golden George Glenny,
Golden Dragon,
Gray's Golden Beverly,
John Salter,
Mabel Wood,
Madame B. Rendatler,
M. Plauchinan,
Mr. George Glenny,
Mr. George Rundle,
Prince Alfred,
Prince of Wales,
Semiramis,
Snowball,
Souvenir de Mercedes,
Sœur Melanie,
Temple of Solomon,
White Eve.

Edwin Fewkes was second in this class and Patrick Malley third.

The first prize for Anemone Flowered Chrysanthemums was taken by Dr. Walcott with a grand specimen of Timbale Argent. Other collections were shown by Norton Brothers, Hovey & Co., Warren Heustis, and Mrs. Francis B. Hayes. Among the collections and specimens many new varieties were shown, the Japanese class predominating.

The display of cut blooms was very large, and hundreds of seedlings were shown. It is evident that while the disposition to grow these is laudable, and should be encouraged, on the other hand there is risk of crowding the field with varieties which are not distinct or remarkable. Many named kinds have been put on the market, which a year hence will be thrown aside by growers as worthless. Standing out in marked distinction from the average run of seedlings was a magnificent white reflexed flower shown by Dr. Walcott. This, which was labelled C 10, was considered the finest white seedling ever shown in Boston, or anywhere else.

It is a perfectly shaped, globular flower, with firm strap-shaped petals of such pure color that Elaine looks dusky beside it. The petals reflex in such a way that the flower appears to be globular, and the centre is filled to perfection. The specimen on exhibition measured nearly five inches. It was awarded a First Class Certificate of Merit. Dr. Walcott showed blooms of other fine seedlings, notably a yellow and a pink Japanese flower, both very large and promising, A Silver Medal was awarded Dr. Walcott for an immense plant of his seedling B 25. This is a small reflexed flower of vigorous habit, but whose chief charm is its intense dark yellow color. It is quite distinct in this respect, and will prove a valuable acquisition. Other fine seedlings of Dr. Walcott, viz.: George Walcott, lilac striped; Colorado, yellow; and Algonquin, yellow; were shown and generally admired. Mr. Fewkes exhibited a group of seedlings, all of good form and color.

A large group of seedlings was shown by Patten & Co., most of them inclining to be open-eyed; but noticeable for the varying forms and colors, which were pleasing.

J. Lewis Childs, of Queens, N. Y., staged a good group of cut blooms, and E. M. Allen, also of Queens, exhibited a bronzy yellow seedling called Brazen Shield.

In the competition for cut blooms Edwin Fewkes was first, with twelve blooms of Chinese Chrysanthemums. This was a very perfect lot; the names were

Barbara,	Mr. Bunn,
Eve,	Mr. Corbay,
Hereward,	Nil Desperandum,
Isabella Bott,	Princess Teck,
Lady Slade,	Rival Little Harry,
Mabel Ward,	St. Patrick.

He was also first for six blooms of Chinese, as follows:

General Slade,	Mrs. Forsythe,
Guernsey Nugget,	Pietro Diaz,
Lord Wolseley,	Princess of Wales.

Edwin Sheppard staged twelve cut blooms of Japanese Chrysanthemums, and took the first prize in this class. The first prize for twenty-four sprays of Japanese blooms went to Edwin Fewkes, for unexampled specimens of

Album plenum,
Aurore Boreale,
Baron de Prailly,
Beauté de Toulouse,
Bend Or,
Boule d'Or,
Bouquet Fait,
Carmen,
Daimio,
Dr. Masters,
Flambeau,
Fulton,
Gloire de Toulouse,
Gloire Rayonnante,
L'Incomparable,
La Frizure,
M. Paul Fabre,
Margot,
Mme. Clemence Audiguier,
Moonlight,
Oracle,
President Parkman,
Source d'Or,
Souvenir de Haarlem.

Mr. Fewkes took the first prize for twenty-four sprays of Chinese, as follows:

Antonelli,
Barbara,
Cherub,
Eve,
Faust,
General Slade,
Golden Queen,
Hereward,
Hero of Stoke Newington,
Isabella Bott,
Jardin des Plantes,
Jeanne d'Arc,
Mabel Ward,
Mr. Bunn,
Mr. Corbay,
Mr. George Glenny,
Mrs. Dixon,
Mrs. Forsythe,
President Sanderson,
Princess Teck,
Rival Little Harry,
Souvenir de Mercedes,
Talford Salter,
Venus.

Mr. Fewkes was first for six blooms of Japanese:

Baron de Prailly,
Belle Paule,
Chinoisiere,
J. Delaux,
Mrs. C. Cary,
Soleil Levant.

The display of Orchids was large, the stage being filled with splendid specimens. F. L. Ames took the first prize for three orchids, showing *Cypripedium insigne Maulei*, with eighteen flowers, *Odontoglossum Alexandræ*, and *Vanda Sanderiana*— the latter bearing a spike of seven highly-colored flowers. E. W. Gilmore was second with *Oncidium ornithorynchum* three feet across, *Odontoglossum grande*, and a fine specimen of *Saccolabium*

Blumei majus. The third prize for three orchids was won by F. L. Ames, with *Vanda cærulea*, *Phalænopsis amabilis*, and *Cypripedium Spicerianum*, the latter with fifteen flowers open. E. W. Gilmore was fourth with *Dendrobium formosum giganteum*, *Oncidium varicosum*, and *Lycaste Skinneri*.

David Allan took the first prize for a specimen orchid with *Vanda cærulea*, bearing two large spikes. F. L. Ames was second with a large specimen of *Cypripedium Harrisonianum*. W. A. Manda, of the Cambridge Botanic Garden, had a fine lot of orchids and rare greenhouse and hardy plants. Mr. Ames exhibited for the first time *Cypripedium tesselatum porphyreum*, a fine hybrid, and *Cypripedium tonsum*, a species. Both are striking orchids, and received First Class Certificates of Merit. There were brilliant collections of cut flowers from many other exhibitors, which in this limited report cannot be alluded to in detail.

Herbaceous Plants. — The prizes for the exhibits of this season having been taken the greatest number of times by Miss S. W. Story, the Society's Silver Medal was awarded to her in conformity with the Schedule; and the Bronze Medal to Anthony McLaren, who was second in competition.

Prospective Prizes. — There were two entries for the best Seedling Flowering or Foliage Plant, as follows: V. H. Hallock, Son, & Thorpe, of Queens, N. Y., entered their Seedling *Lilium speciosum*, Opal. This is a good form of *speciosum*, with petals spotted with carmine. H. B. Watt entered his Seedling Gladiolus, Fairy. This is a pure white variety, with a well-formed spike, and showing evidence of good habit. The Committee defer any action on these entries until they can have further opportunity to determine the absolute value of the productions named.

The amount awarded during the year has been $2,716, out of the sum of $2,750 appropriated; of this amount $1,712 was given for prizes, and $1,004 for gratuities.

Respectfully submitted.

Edwd. L. Beard,
David Allan,
J. H. Woodford,
James Cartwright,
Edwin Fewkes,
P. Norton,

Committee on Plants and Flowers.

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

JANUARY 10.

Gratuities: —

Mrs. Francis B. Hayes, Camellias and Cut Flowers,	$2 00
Stillman S. Hovey, Cut Flowers,	1 00
Mrs. P. D. Richards, Native Mosses and Perennials,	2 00

JANUARY 17.

Gratuities: —

Mrs. Francis B. Hayes, Camellias,	2 00
W. K. Wood, Vase of Flowers,	2 00
C M. Hovey, Camellias and Violets,	1 00

JANUARY 24.

Gratuity: —

John L. Gardner, six pots Lilies of the Valley,	2 00

JANUARY 31.

Gratuities: —

Mrs. Francis B. Hayes, Camellias and Cut Flowers,	2 00
C. M. Hovey, *Cypripedium insigne*,	2 00
" " *Helleborus niger*, Otto,	1 00

FEBRUARY 7.

Gratuities: —

Mrs. Francis B. Hayes, Camellias,	2 00
Miss Sarah W. Story, Cut Flowers,	1 00

FEBRUARY 14.

Gratuity: —

Mrs. Francis B. Hayes, Camellias,	2 00

FEBRUARY 21.

Gratuities: —

Mrs. Francis B. Hayes, Camellias, etc.,	2 00
C. M. Hovey, Camellias,	1 00
Mrs. E. M. Gill, Narcissus, etc.,	1 00

FEBRUARY 28.

Gratuities: —

E. M. Wood & Co., sixteen Maréchal Niel Roses,	5 00
John B. Moore & Son, Hybrid Perpetual Roses,	5 00
William H. Spooner, Hybrid Perpetual Roses,	1 00
Mrs. Francis B. Hayes, Camellias and Rhododendrons,	3 00
Delay & Meade, Cut Blooms of Niphetos, Catherine Mermet, and Cornelia Cook Roses,	3 00
C. M. Hovey, *Imantophyllum Van Houttei*,	2 00

C. M. Hovey, Cut Flowers,	$3 00
Miss Sarah W. Story, Cut Flowers,	2 00
Stillman S. Hovey, " "	2 00
W. K. Wood, Vase of " "	2 00

MARCH 7.

Gratuities: —

Mrs. Francis B. Hayes, collection of Camellias and Cut Flowers,	3 00
John B. Moore & Son, Hybrid Perpetual Roses,	3 00
Jackson Dawson, Hybrid Perpetual Roses on Japanese stock,	2 00
C. M. Hovey, Azalea in pot,	2 00
" " Cut Flowers,	2 00
Miss Sarah W. Story, Cut Flowers,	1 00
William H. Spooner, Hybrid Perpetual Roses, Marguerite de Roman and Heinrich Schultheis,	1 00
Delay & Meade, collection of Tea Roses,	2 00

MARCH 14.

Gratuities: —

L. W. Hastings, Hybrid Perpetual Roses,	4 00
John B. Moore & Son, " " "	3 00
William H. Spooner, " " "	1 00
Eben Bacon, Pot Rose, Merveille de Lyon,	1 00
C. H. Hovey & Co., Camellias,	2 00

SPRING EXHIBITION.

MARCH 19 AND 20.

INDIAN AZALEAS. — Six named varieties, in pots, Arthur W. Blake,	$12 00
Second, Arthur W. Blake,	10 00
Two named varieties, Arthur W. Blake,	6 00
Second, Arthur W. Blake,	4 00
Specimen plant, named, Marshall P. Wilder, Reine des Roses,	5 00
Second, Arthur W. Blake, Duchesse de Fernan Nunez,	4 00
Four named varieties, in not exceeding ten-inch pots, Arthur W. Blake,	10 00
Second, Marshall P. Wilder,	2 00
Single plant of any named variety, in not exceeding an eight-inch pot, Arthur W. Blake, *Amœna Caldwelli*,	3 00
Second, Marshall P. Wilder, Rhenania,	2 00
HYBRID PERPETUAL ROSES. — Three plants, distinct named varieties, Jackson Dawson,	8 00
Second, Mrs. Francis B. Hayes,	6 00
Single named plant, Jackson Dawson, Abel Carrière,	5 00
Second, Mrs. Francis B. Hayes, Emily Laxton,	4 00

Twenty-four cut blooms, not less than six distinct named varieties, excluding General Jacqueminot, John B. Moore & Son,	$12 00
Six cut blooms, distinct named varieties, John B. Moore & Son,	5 00
Single bloom of any named variety, John B. Moore & Son, White Baroness,	2 00
Second, John B. Moore & Son, Mad. Victor Verdier,	1 00
TENDER ROSES, IN VASES. — Twelve blooms of Bon Silène, S. Niel,	3 00
Second, Delay & Meade,	2 00
Twelve blooms of Catherine Mermet, C. M. Hovey,	5 00
Second, Delay & Meade,	4 00
Twelve blooms of Cornelia Cook, Delay & Meade,	5 00
Twelve blooms of Niphetos, Delay & Meade,	5 00
Second, Edwin Sheppard,	4 00
Twelve blooms of Safrano, Edwin Sheppard,	3 00
Second, S. Niel,	2 00
Twelve blooms of Souvenir de la Malmaison, the second prize to Delay & Meade,	4 00
ORCHIDS. — Six plants in bloom, F. L. Ames,	12 00
Second, H. H. Hunnewell,	10 00
Third, David Allan,	8 00
Three plants in bloom, H. H. Hunnewell,	8 00
Second, F. L. Ames,	6 00
Third, David Allan,	5 00
Single plant in bloom, F. L. Ames, *Odontoglossum Roezli*,	5 00
Second, David Allan, *Dendrobium Ainsworthii*,	4 00
Third, F. L. Ames, *Odontoglossum triumphans*,	3 00
GREENHOUSE PLANT. — Specimen in bloom other than Azalea or Orchid, named, John L. Gardner, *Imantophyllum miniatum*,	5 00
Second, Mrs. Francis B. Hayes, *Rhododendron Veitchianum lævigatum*,	4 00
CYCLAMENS. — Six plants in bloom, Edward L. Beard,	6 00
Two plants in bloom, Edward L. Beard,	3 00
Single plant in bloom, Edward L. Beard,	2 00
HEATHS, OR EPACRISES. — Three plants in bloom, the second prize to C. M. Hovey,	3 00
HARDY PRIMROSES, OR POLYANTHUSES. — Six plants, of distinct varieties, in bloom, Jackson Dawson,	4 00
Second, Jackson Dawson,	3 00
CINERARIAS. — Six varieties in bloom, in not over nine-inch pots, E. W. Gilmore,	8 00
Second, Edwin Sheppard,	6 00
Third, Jackson Dawson,	4 00
Single plant in bloom, E. W. Gilmore,	3 00
Second, Edwin Sheppard,	2 00
VIOLETS. — Six pots, in bloom, Edwin Sheppard,	3 00

PANSIES. — Six distinct varieties, in pots, in bloom, Denys Zirngiebel, ... $5 00
Second, C. M. Hovey, ... 4 00
Fifty cut blooms, in the Society's flat fruit dishes, Denys Zirngiebel, ... 3 00
Second, Denys Zirngiebel, ... 2 00
Third, Denys Zirngiebel, ... 1 00
CARNATIONS. — Display of cut blooms, not less than six varieties, in vases, J. A. Foster, ... 4 00
Second, Denys Zirngiebel, ... 3 00
CAMELLIAS. — Display of named varieties, cut flowers, with foliage, not less than twelve blooms of not less than six varieties, C. M. Hovey, ... 4 00
Second, Mrs. Francis B. Hayes, ... 3 00
Six cut blooms of not less than four named varieties, with foliage, John L. Gardner, ... 2 00
CUT FLOWERS. — Display in the Society's glass vases, W. K. Wood, ... 8 00
Second, Mrs. Francis B. Hayes, ... 6 00
BASKET OF FLOWERS. — Best arranged, James O'Brien, . . 8 00
HYACINTHS. — Twelve distinct named varieties in pots, one in each pot, in bloom, John L. Gardner, ... 10 00
Second, C. H. Hovey & Co., ... 8 00
Third, C. M. Hovey, ... 6 00
Six distinct named varieties in pots, one in each pot, in bloom, C. M. Hovey, ... 6 00
Second, C. H. Hovey & Co., ... 5 00
Third, John L. Gardner, ... 4 00
Three distinct named varieties, in pots, one in each pot, in bloom, C. H. Hovey & Co., ... 4 00
Second, C. M. Hovey, ... 3 00
Single named bulb, in pot, in bloom, C. H. Hovey & Co., Czar Peter, ... 2 00
Second, John L. Gardner, Czar Peter, ... 1 00
Three pans, ten bulbs of one variety in each pan, John L. Gardner, ... 6 00
Second, C. H. Hovey & Co., ... 4 00
TULIPS. — Six six-inch pots, four bulbs in each, in bloom, John L. Gardner, ... 5 00
Second, James O'Brien, ... 4 00
Third, C. M. Hovey, ... 3 00
Three six-inch pots, four bulbs in each, in bloom, the second prize to C. M. Hovey, ... 3 00
Third. C. H. Hovey & Co., ... 2 00
POLYANTHUS NARCISSUS. — Four six-inch pots, three bulbs in each, in bloom, Edward L. Beard, ... 6 00
Second, Edward L. Beard, ... 4 00

HARDY NARCISSUS OR DAFFODILS. — Best display, Edward L. Beard, ... $6 00
Second, C. M. Hovey, ... 4 00
JONQUILS. — Four six-inch pots, six bulbs in each, in bloom, C. H. Hovey & Co., ... 3 00
Second, John L. Gardner, ... 2 00
GENERAL DISPLAY OF SPRING BULBS, all classes. — C. M. Hovey, 15 00
Second, C. H. Hovey & Co., ... 10 00
Third, Edward L. Beard, ... 8 00
LILY OF THE VALLEY. — Six six-inch pots, in bloom, John L. Gardner, ... 4 00
Second, James O'Brien, ... 3 00

Gratuities: —

Mrs. Francis B. Hayes, Azaleas and Roses, ... 10 00
John B. Moore & Son, Cut Roses, ... 5 00
L. W. Hastings, " " 4 00
William H. Spooner, pot of Merveille de Lyon Roses, . . . 3 00
Delay & Meade, Tea Roses, ... 3 00
John B. Moore & Son, New Roses, Lord Frederick Cavendish and Souvenir de Reine Leveque, ... 2 00
Jackson Dawson, Roses, Primroses, etc., ... 5 00
" " Roses, ... 2 00
John L. Gardner, Primroses, Mignonette, Anemones, etc., . . 6 00
Frederick L. Ames, Pot Orchids, ... 20 00
H. H. Hunnewell, Pot Orchids, ... 10 00
David Allan, gardener to R. M. Pratt, Pot Orchids, . . . 10 00
E. W Gilmore, Orchids, ... 5 00
W. A. Manda, " 2 00
Mrs. E. M. Gill, Amaryllis, ... 2 00
W. A. Manda, Palms and Foliage Plants, ... 12 00
" " Herbaceous Plants, in pots, ... 3 00
C. M. Hovey, Pot Plants, ... 5 00
Joseph Tailby, Wreath. 4 00
Benjamin G. Smith, Pinks, etc., ... 1 00
Miss Sarah W. Story, Cut Flowers, ... 2 00
David Allan, " " 5 00
H. H. Hunnewell, " " 5 00
Frederick L. Ames, " " 3 00
Stillman L. Hovey, " " 3 00
Edwin Sheppard, " " 3 00
C. M. Hovey, " " 2 00
Mrs. P. D. Richards, Mosses, etc., ... 2 00

MARCH 28.

Gratuities: —

John B. Moore & Son, Hybrid Perpetual Roses, twenty-four varieties, ... 3 00

Mrs. Francis B. Hayes, Hybrid Perpetual Roses,	$2 00
" " " Pot Azaleas and Cut Flowers,	3 00
" " " Pot Rose, Édouard Morren,	1 00
John L. Gardner, Hyacinths,	2 00
Mrs. A. D. Wood, Vase of Flowers,	2 00

APRIL 4.

Gratuities: —

Mrs. Francis B. Hayes, Cut Flowers,	3 00
" " " Pot Rose,	1 00
W. H. Badlam, *Primula vulgaris*, twelve pots,	2 00
John B. Moore & Son, Hybrid Perpetual Roses,	2 00

APRIL 11.

Gratuities: —

Frederick L. Ames, varieties of *Pescatorea*,	6 00
John L. Gardner, *Cytisus elegans*,	2 00
C. D. Kingman, Seedling double white Pelargonium,	1 00
Mrs. Francis B. Hayes, Cut Rhododendrons,	1 00
" " " Cut Flowers,	1 00
W. K. Wood, " "	1 00
Miss Sarah W. Story, " "	1 00
Mrs. E. M. Gill, " "	1 00
Edwin Sheppard, " "	1 00
Stillman S. Hovey, " "	1 00

APRIL 18.

Gratuities: —

N. S. Simpkins, forty-two cut blooms of Cornelia Cook and Catherine Mermet Roses,	4 00
W. H. Badlam, Twelve Primroses and six Polyanthuses,	2 00
Edwin Fewkes, Plant of *Tropæolum tricolorum*,	1 00
Edward L. Beard, Pansies,	1 00
Miss Sarah W. Story, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00

APRIL 25.

Gratuities: —

Mrs. Francis B. Hayes, *Rhododendron fragrantissimum*,	1 00
Edwin Fewkes, Double Primrose, Cloth of Gold,	1 00
Mrs. A. D. Wood, Vase of Flowers,	1 00
Miss Sarah W. Story, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00
Mrs. P. D. Richards, Native Flowers,	1 00

MAY EXHIBITION.

May 9.

Indian Azalea.—Single plant in pot, named, C. M. Hovey, Mad. Mielliez,	$6 00
Second, C. M. Hovey, Chilsoni,	5 00
Basket of Flowers.—Mrs. E. M. Gill,	4 00
Second, Mrs. S. S. Hovey,	3 00
Pansies.—Fifty cut blooms in the Society's flat fruit dishes, the second prize to Mrs. E. M. Gill,	3 00
Third, William A. Bock,	2 00
Gratuities:—	
David Allan, Auriculas,	5 00
" " Orchids,	5 00
Edwin Sheppard, Orchids,	3 00
C. M. Hovey, Camellias,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	3 00
Miss Sarah W. Story, " "	2 00
Sullman S. Hovey, " "	2 00
Edwin Sheppard, " "	2 00
Mrs. P. D. Richards, Wild Flowers,	2 00
Mrs. E. M. Gill, " "	1 00

May 23.

Gratuities:—	
Jackson Dawson, Weigelas, Pyrus, etc.,	2 00
Mrs. Francis B. Hayes, Rhododendrons and Violas,	1 00
Miss Sarah W. Story, Cut Flowers,	1 00
Mrs. A. D. Wood, " "	1 00
Mrs. P. D. Richards, Wild Flowers,	1 00

RHODODENDRON SHOW.

June 6.

Rhododendrons.—Twenty-four tender varieties, named, Mrs. Francis B. Hayes,	$10 00
Twelve tender varieties, named, Mrs. Francis B. Hayes,	6 00
Six tender varieties, named, " " "	3 00
Three tender varieties, named, " " "	2 00
Single truss of any tender variety, named, Mrs. Francis B. Hayes, Towardii,	1 00
Six hardy varieties, named, Mrs. Francis B. Hayes,	3 00
Hardy Azaleas.—From any or all classes, cluster of trusses, of one variety, Benjamin G. Smith,	1 00
Tree Pæonies.—Six named varieties, Marshall P. Wilder,	3 00

CLEMATIS.— Named varieties, display of cut blooms, Joseph H. Woodford, ... $3 00

HARDY FLOWERING TREES AND SHRUBS.— Largest and best collection, named, cut blooms, Benjamin G. Smith, . . 5 00

NATIVE PLANTS — Display of named species and varieties, one bottle of each, Mrs. P. D. Richards, ... 3 00

CUT FLOWERS.— Display, filling one hundred bottles, W. K. Wood, 4 00

Second, Mrs. E. M. Gill, ... 3 00

HERBACEOUS PLANTS.— Miss Sarah W. Story, ... 2 00

Gratuities:—

H. H. Hunnewell, Forty-two varieties of Rhododendrons, . . 10 00

Mrs. Francis B. Hayes, Cut Rhododendrons, ... 5 00

Edwin Sheppard, " " 2 00

H. H. Hunnewell, Thirty Ghent Azaleas, ... 5 00

" " Twelve varieties of *Azalea mollis*, . . . 2 00

" " Sixty varieties of *Azalea Indica*, . . . 2 00

Edwin Sheppard, Azaleas, ... 2 00

Mrs. Francis B. Hayes, Flowering Trees and Shrubs, . . . 3 00

Edwin Sheppard, Primroses, etc., ... 1 00

Miss Sarah W. Story, Cut Flowers, ... 2 00

Benjamin G. Smith, " " 1 00

Robert T. Jackson, Wild Flowers, ... 2 00

E. H Hitchings, " " 2 00

Miss Mary L. Vinal, " " 1 00

JUNE 13.

Gratuities:—

Mrs. Francis B. Hayes, One hundred and fifty blooms of Rhododendrons; also Iris and Azaleas, ... 10 00

H. H. Hunnewell Rhododendrons and Azaleas, ... 10 00

J. H. Woodford, Clematis and Roses, ... 2 00

Miss Sarah W. Story, Herbaceous Plants, ... 1 00

Edwin Sheppard, Cut Flowers, ... 3 00

Mrs. E. M. Gill, " " 2 00

Mrs. E. S. Joyce, " " 2 00

Miss S. W. Story, " " 2 00

Mrs. P. D. Richards, Wild Flowers from Essex County, . . 2 00

JUNE 20.

Gratuities:—

John B. Moore & Son, Roses, Pæonies, and Clematis, including twelve varieties of Moss Roses, ... 5 00

Mrs. Francis B. Hayes, Roses, ... 2 00

" " " Rhododendrons, etc., ... 5 00

" " " Fifteen new Rhododendrons, . . . 3 00

Miss Sarah W. Story, Herbaceous Plants, ... 1 00

E. L. Beard, *Rosa rugosa alba*, and Double Pyrethrum,	$1 00
John C. Hovey, Double Pyrethrums, four varieties,	1 00
Miss Sarah W. Story, Cut Flowers,	2 00
J. H. Woodford, " "	2 00
Edwin Sheppard, " "	2 00
Miss E. M. Harris, " "	1 00
Benjamin G. Smith, " "	1 00
Mrs. E. S. Joyce, " "	1 00
Miss Mary L. Vinal, Wild Flowers,	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 25 AND 26.

Special Subscription Prizes.

HYBRID PERPETUAL ROSES. — Twenty-four of different varieties, named, John B. Moore & Son, Silver Vase, value,	$40 00
Second, William H. Spooner, Silver Vase, value,	25 00
Six Roses, of different varieties, named, John S. Richards, Silver Vase, value,	15 00
Twelve Roses, of different varieties, named, David Allan, Silver Vase, value,	20 00
Eighteen Roses, of different varieties, named, John L. Gardner, Silver Vase, value,	25 00
Six Roses, of any two varieties, three of each, named, John L. Gardner, Silver Vase, value,	15 00
Twelve Roses, of any four varieties, three of each, named, David Allan, Silver Vase, value,	20 00
Eighteen Roses, of any six varieties, three of each, named, John B. Moore & Son, Silver Vase, value,	25 00

Amateurs' Prize.

Twenty-four Roses, of different varieties, named, John L. Gardner, Silver Vase, value,	50 00

Society's Special Prizes.

HYBRID PERPETUAL ROSES. — Six blooms of Alfred Colomb, John B. Moore & Son,	4 00
Second, William H. Spooner,	3 00
Six blooms of Baroness Rothschild, the second prize to John B. Moore & Son,	3 00
Six blooms of Jean Liabaud, John B. Moore & Son,	4 00
Six blooms of John Hopper, " " "	4 00
Six blooms of Marquise de Castellane, John B. Moore & Son,	4 00
Second, David Allan,	3 00
Six blooms of Madame Gabriel Luizet, John B. Moore & Son,	4 00
Second, William H. Spooner,	3 00
Twelve blooms of any other variety, John B. Moore & Son,	6 00

Single bloom of any variety, John B. Moore & Son, François Michelon, ... $3 00
Second, David Allan, Merveille de Lyon, ... 2 00
Third, John L. Gardner, " " " 1 00

Regular Prizes.

HARDY PERPETUAL ROSES. — Best six new varieties sent out since 1880, John B. Moore & Son, ... 5 00
Twenty-four distinct named varieties, three of each variety, John B. Moore & Son, ... 20 00
Twelve distinct named varieties, three of each variety, John B. Moore & Son, ... 10 00
Second, John S. Richards, ... 8 00
Third, " " 6 00
Six distinct named varieties, three of each variety, John S. Richards, ... 8 00
Three distinct named varieties, three of each variety, John S. Richards, ... 4 00
MOSS ROSES. — Six named varieties, three clusters of each, John B. Moore & Son, ... 6 00
Second, William H. Spooner, ... 4 00
Three named varieties, three clusters of each, John B. Moore & Son, ... 4 00
HYBRID TEA ROSES. — Display in boxes, John S. Richards, . 6 00
Second, John S. Richards, ... 4 00
GENERAL DISPLAY of Hardy Roses, filling one hundred bottles, John B. Moore & Son, ... 10 00
Second, John S. Richards, ... 9 00
Third, William H. Spooner, ... 8 00
Fourth, C. M. Hovey, ... 7 00
Fifth, Benjamin G. Smith, ... 6 00
STOVE AND GREENHOUSE FLOWERING PLANTS. — Specimen Plant in bloom, named, other than Orchid, David Allan, *Erica Cavendishiana*, ... 6 00
Second, Frederick L. Ames, *Utricularia montana*, ... 4 00
SPECIMEN FOLIAGE OR FLOWERING PLANT, new and rare, other than Orchid, Frederick L. Ames, *Dichorisandra musaica*, . 4 00
ORCHIDS. — Twelve plants, named varieties, in bloom, Frederick L. Ames, ... 18 00
Second, David Allan, ... 15 00
Six plants, named, Frederick L. Ames, ... 10 00
Second, E. W. Gilmore, ... 8 00
Three plants, named, E. W. Gilmore, ... 8 00
HERBACEOUS PÆONIES. — Ten named varieties, the second prize to C. M. Hovey, ... 3 00
SWEET WILLIAMS. — Thirty trusses, not less than six distinct varieties, Edwin Sheppard & Son, ... 3 00
Second, Benjamin G. Smith, ... 2 00

VASE OF FLOWERS. — Best arranged, in one of the Society's glass vases, Mrs. E. M. Gill, ... $5 00
Second, Mrs. A. D. Wood, ... 4 00
HERBACEOUS PLANTS. — Miss Sarah W. Story, ... 2 00

Gratuities: —

F. Becker, Plants in Pots, ... 40 00
C. M. Hovey, Display of Plants, ... 25 00
W. A. Manda, Orchids and Ferns, ... 12 00
Frederick L. Ames, Orchids, ... 10 00
Samuel R. Payson, " 8 00
David Allan, Orchids and Ferns, and Cut Flowers, . . . 8 00
" " Stove and Greenhouse Plants, ... 5 00
Mrs. Francis B. Hayes, Cut Roses, ... 5 00
Mrs. E. M. Gill, Display of Roses, ... 5 00
John S. Richards, Cut Roses, ... 2 00
C. M. Hovey, *Hydrangea Otaksa*, and Pelargoniums, . . . 4 00
Edwin Sheppard, Delphiniums, ... 3 00
Mrs. Francis B. Hayes, Rhododendrons, ... 3 00
" " " " Clematis and Kalmias, ... 1 00
C. M. Hovey, Kalmias and Rhododendrons, ... 2 00
Robert Jackson, Pansies and Hardy Orchids, ... 2 00
C. M. Hovey, Pelargoniums, ... 2 00
John C. Hovey, Seedling Pæonies, ... 2 00
Miss Ellen M. Harris, " 1 00
Mrs. E. M. Gill, " 1 00
Benjamin G. Smith, Sweet Williams, ... 1 00
Joseph Tailby, Carnations, ... 1 00
Miss Sarah W. Story, Cut Flowers, ... 4 00
W. K. Wood, " " 5 00
Edwin Sheppard, " " 4 00
C. M. Hovey, " " 2 00
E. W. Gilmore, " " 2 00
Frederick L. Ames, " " 2 00
Mrs. P. D. Richards, Native Plants, ... 3 00

JULY 11.

HYBRID PERPETUAL ROSES. — Twenty-four blooms of twenty-four distinct named varieties, John B. Moore & Son, . 4 00
DELPHINIUMS. — Six named varieties, Edwin Sheppard, . . 3 00
Second, Benjamin G. Smith, ... 2 00
LILIUM CANDIDUM. — Twelve spikes, Benjamin G. Smith, . . 3 00
Second, John L. Gardner, ... 2 00
JAPAN IRIS — Varieties of *Iris Kæmpferi*. — Display, John L. Gardner, ... 6 00
Twelve named varieties, J. F. C. Hyde, ... 4 00

VASE OF FLOWERS. — Best arranged, in one of the Society's glass vases, Miss Sarah W. Story, ... $3 00
Second, Mrs. E. M. Gill, ... 2 00
CUT FLOWERS. — Display, filling one hundred bottles, Mrs. E. M. Gill, ... 4 00
Second, W. K. Wood, ... 3 00
HERBACEOUS PLANTS. — Miss Sarah W. Story, ... 2 00
Second, A. McLaren, ... 1 00

Gratuities: —

Joseph H. Woodford, Pansies, ... 1 00
C. M. Hovey, Native Rhododendrons, ... 1 00
Miss E. M. Harris, Lilies, ... 1 00
Miss Sarah W. Story, Cut Flowers, ... 1 00
Mrs. E. S. Joyce, " " 1 00
Edwin Fewkes, " " 1 00
Mrs. P. D. Richards, Native Plants, ... 1 00

JULY 18.

HOLLYHOCKS. — Twelve blooms, of twelve distinct colors, Edwin Sheppard, ... 4 00
Six blooms, of six distinct colors, Edwin Fewkes, ... 2 00
Second, John S. Richards, ... 1 00
Three blooms, of three distinct colors, Miss Ellen M. Harris, . 1 00
CUT FLOWERS. — Display, filling one hundred bottles, C. M. Hovey, ... 4 00
Second, Mrs. E. M. Gill, ... 3 00
Third, W. K. Wood, ... 2 00
HERBACEOUS PLANTS. — A. McLaren, ... 2 00
Second, Miss S. W. Story, ... 1 00

Gratuities: —

Edwin Sheppard, Hollyhocks, ... 2 00
Miss E. M. Harris, " 1 00
Edwin Fewkes, Tea Roses, ... 1 00
Miss Sarah W. Story, Cut Flowers, ... 2 00

JULY 25.

PELARGONIUMS. — Six double and six single varieties, named, one truss each, E. Sheppard & Son, ... 2 00
Second, C. M. Hovey, ... 1 00
PERENNIAL PHLOXES. — Six distinct named varieties, one spike each, Edwin Sheppard, ... 3 00
Second, John B. Moore & Son, ... 2 00
VERBENAS. — Thirty bottles, one truss in each, Adin A. Hixon, . 3 00
Second, C. M. Hovey, ... 2 00
SWEET PEAS. — Display, filling twenty-five bottles, Edwin Fewkes, 3 00
Second, Mrs. E. M. Gill, ... 2 00

HERBACEOUS PLANTS. — Anthony McLaren, ... $2 00
Second, Miss S. W. Story, ... 1 00

Gratuities: —

W. S. Ward, Hollyhocks, ... 2 00
A. A. Hixon, Dwarf Nasturtiums, ... 1 00
" " Pelargoniums, ... 1 00
Edwin Sheppard, " 1 00
" " Phlox, ... 1 00
John B. Moore & Son, Hybrid Perpetual Roses, ... 1 00
Edwin Fewkes, Poppies, ... 1 00
Miss Sarah W. Story, Cut Flowers, ... 2 00
Mrs. E. M. Gill, " " 2 00
Mrs. P. D. Richards, Wild Flowers, ... 3 00

AUGUST 1.

BALSAMS. — Twelve spikes, not less than eight varieties, Edwin Sheppard, ... 2 00
CUT FLOWERS. — Display, filling one hundred bottles, Mrs. E. M. Gill, ... 4 00
Second, William K. Wood, ... 3 00
Third, C. M. Hovey, ... 2 00
NATIVE FERNS. — Best display, Mrs. P. D. Richards, . . . 3 00
HERBACEOUS PLANTS. — A. McLaren, ... 2 00
Second, Miss Sarah W. Story, ... 1 00

Gratuities: —

John L. Gardner, two Hydrangeas, ... 3 00
John B. Moore & Son, Hybrid Perpetual Roses, ... 2 00
Denys Zirngiebel, Asters, ... 1 00
Edwin Fewkes, Poppies, ... 1 00
Edwin Sheppard, Balsams, ... 1 00
Mrs. P. D. Richards, Native Flowers, ... 1 00

AUGUST 7.

PERENNIAL PHLOXES. — Ten distinct named varieties, one spike each, John B. Moore & Son, ... 3 00
Second, Edwin Sheppard, ... 2 00
PETUNIAS. — Collection, filling thirty bottles, one spray in each, A. A. Hixon, ... 3 00
Second, John Parker, ... 2 00
Third, A. A. Hixon, ... 1 00
CUT FLOWERS. — Display, filling one hundred bottles, Mrs. E. M. Gill, ... 4 00
NATIVE FLOWERS. — Collection, Mrs. P. D. Richards, . . . 3 00
HERBACEOUS PLANTS. — Miss Sarah W. Story, ... 2 00
Second, Anthony McLaren, ... 1 00

Gratuities: —

John B. Moore & Son, Hybrid Perpetual Roses, ... $2 00
A. A Hixon, Petunias, Verbenas, and Sweet Peas, . . . 2 00
Benjamin G. Smith, Roses and Phlox, ... 1 00
Edwin Sheppard, Cut Flowers, ... 1 00

AUGUST 15.

GLADIOLI.—Twenty named varieties, in spikes, James Cartwright, 10 00
Second, Mrs. T. L. Nelson, ... 8 00
Ten named varieties in spikes, the second prize to H. B. Watts, 4 00
Six " " " Mrs. T. L. Nelson, . . . 5 00
Second, H. B. Watts, ... 3 00
Single spike, named, James Cartwright, Ambroise Verschaffelt, 1 00
Display of named or unnamed varieties, filling one hundred bottles, James Cartwright, ... 8 00
Second, H. B. Watts, ... 6 00
Third, Edwin Sheppard, ... 4 00
PHLOX DRUMMONDI. — Fifty bottles, not less than six varieties, L. W. Goodell, ... 2 00
Second, C. M. Hovey, ... 1 00
HERBACEOUS PLANTS.— Anthony McLaren, ... 2 00
Second, Miss Sarah W. Story, ... 1 00

Gratuities:—

John B. Moore & Son, Roses and Phloxes, ... 2 00
A. A. Hixon, Petunias, Verbenas, Sweet Peas, and Dahlias, . . 2 00
L. W. Goodell, Petunias and Verbenas, ... 1 00
George S. Tuttle, Pompon Dahlias, ... 1 00
Mrs. A. D. Wood, Cut Flowers, ... 1 00
Mrs. E. M. Gill, " " 1 00
Miss Sarah W. Story, " " 1 00
Edwin Fewkes, " " 1 00
Stillman S. Hovey, " " 1 00

AUGUST 22.

ASTERS. — Truffaut's Pæony Flowered, thirty blooms, not less than ten varieties, Edwin Sheppard, ... 5 00
Second, Warren Heustis, ... 4 00
Victoria Flowered, thirty blooms, not less than eight varieties, Edwin Sheppard, ... 5 00
Second, William Patterson, ... 4 00
Third, James Cartwright, ... 3 00
Pompon, thirty sprays, not less than six varieties, one spray in each bottle, L. W. Goodell, ... 4 00
Second, Edwin Sheppard, ... 3 00
BASKET OF FLOWERS. — Best arranged, James O'Brien, . . 2 00
Second, Miss Sarah W. Story, ... 1 00

HERBACEOUS PLANTS, — Anthony McLaren, ... $2 00
Second, Miss Sarah W. Story, ... 1 00

Gratuities:—

James Cartwright, Display of Gladioli, ... 3 00
H. B. Watts, " " 2 00
W. K. Wood, Gladioli, Asters, and Roses, ... 2 00
E. H. Hitchings, Native Plants, ... 1 00
L. W. Goodell, Petunias and Balsams, ... 1 00
Edwin Fewkes, Dahlias, Zinnias, etc., ... 1 00
Mrs. E. M. Gill, Asters, ... 1 00
James Cartwright, " 1 00
Edwin Sheppard, " 1 00
Mrs. Francis B. Hayes, Cut Flowers, ... 5 00
Miss Sarah W. Story, " " 1 00
Mrs. E. M. Gill, " " 1 00
C. M. Hovey, " " 1 00
Mrs. P. D. Richards, Wild Flowers, ... 2 00

AUGUST 29.

LILIUM LANCIFOLIUM. — Twelve spikes, the second prize to Miss Sarah W. Story, ... 2 00
TROPÆOLUMS. — Display, filling twenty-five bottles, the third prize to H. B. Watts, ... 1 00
MARIGOLDS. — Twenty-five bottles, three flowers in each, Stillman S. Hovey, ... 3 00
Second, William K. Wood, ... 2 00
Third, Mrs. E. M. Gill, ... 1 00
SINGLE DAHLIAS. — Twenty-four bottles, one spray in each, the second prize to Edwin Sheppard, ... 2 00
HERBACEOUS PLANTS. — Miss Sarah W. Story, ... 2 00
Second, Anthony McLaren, ... 1 00

Gratuities:—

James Cartwright, Gladioli, ... 2 00
V. H. Hallock, Son, & Thorpe, Gladioli, ... 1 00
H. B. Watts, " 1 00
George S. Tuttle, Dahlias, ... 1 00
Edwin Fewkes, " 1 00
" " Phlox. 1 00
" " Cut Flowers, ... 1 00
A. A. Hixon, " " 1 00
John Parker, " " 1 00
Mrs. Francis B. Hayes, Cut Flowers, ... 1 00
Miss Sarah W. Story, " " 1 00
Mrs. E. M. Gill, " " 1 00
Edwin Sheppard, " " 1 00

Stillman S. Hovey, Cut Flowers,	$1 00
William K. Wood, " "	1 00
Mrs. P. D. Richards, Wild Flowers,	1 00

SEPTEMBER 5.

DOUBLE ZINNIAS. — Twenty-five flowers, not less than six varieties, Edwin Sheppard,	3 00
Second, Edwin Fewkes,	2 00
Third, L. W. Goodell,	1 00
DIANTHUS — Annual and Biennial varieties. — Collection, filling fifty boxes, single trusses, L. W. Goodell,	4 00
Second, H. B. Watts,	3 00
CUT FLOWERS. — Display, filling one hundred bottles, Mrs. E. M. Gill,	4 00
Second, William K. Wood,	3 00
Third, A. A. Hixon,	2 00
HERBACEOUS PLANTS. — Miss Sarah W. Story,	2 00
Second, Anthony McLaren,	1 00

Gratuities: —

James Cartwright, Gladioli,	2 00
H. B. Watts, "	2 00
L. W. Goodell, Petunias,	1 00
A. A. Hixon, "	1 00
W. C. Strong, Foliage of seventeen varieties of Maples,	1 00
Mrs. Francis B. Hayes, Rhododendrons,	1 00
Edwin Sheppard, Dianthus,	1 00
George S. Tuttle, Pompon Dahlias,	1 00
John Parker, Dahlias,	1 00
Edwin Fewkes, "	1 00
Mrs. Francis B. Hayes, Cut Flowers,	1 00
Stillman S. Hovey, " "	2 00
Edwin Fewkes, " "	1 00
Edwin Sheppard, " "	1 00
Miss Sarah W. Story, " "	1 00
C. M. Hovey, " "	1 00
William J. Martin, " "	1 00
John Parker, " "	1 00
Mrs. P. D. Richards, Native Plants,	1 00

ANNUAL EXHIBITION.

SEPTEMBER 16, 17, 18 AND 19.

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS. — Display in pots of other than Native Evergreens of New England, named, William C. Strong,	$8 00
Second, J. W. Manning,	6 00

Society's Prizes.

GREENHOUSE PLANTS. — Twelve Greenhouse and Stove Plants, of different named varieties, one Dracæna and one Croton admissible, H. H. Hunnewell,	$40 00
Second, Samuel R. Payson,	30 00
Third, David Allan,	25 00
Fourth, C. H. Hovey & Co.,	20 00
SPECIMEN FLOWERING PLANTS. — Six named varieties, in bloom, David Allan,	15 00
Single named specimen, David Allan, *Anthurium Andreanum*,	5 00
Second, Frederick L. Ames, " "	4 00
Third, David Allan, *Grevillea Preissii*,	3 00
VARIEGATED LEAVED PLANTS. — Six named varieties, not offered in the collection of greenhouse plants, Crotons and Dracænas not admissible, H. H. Hunnewell,	12 00
Second, Frederick L. Ames,	10 00
Third, Samuel R. Payson,	8 00
Single specimen, named, not offered in any collection, G. A. Nickerson, Croton Queen Victoria,	5 00
Second, John L. Gardner. *Eurya latifolia variegata*,	4 00
CALADIUMS. — Four named varieties, Frederick L. Ames,	5 00
Second, David Allan,	4 00
FERNS — Six named varieties, no Adiantums admissible, Frederick L. Ames,	8 00
Second, David Allan,	6 00
ADIANTUMS. — Six named varieties, David Allan,	6 00
Second, Samuel R. Payson,	4 00
TREE FERN. — Single specimen, named, David Allan,	6 00
Second, G. A. Nickerson,	4 00
LYCOPODS. — Four named varieties, David Allan,	3 00
DRACÆNAS. — Six named varieties, H. H. Hunnewell,	8 00
Second, E. W. Gilmore,	6 00
CROTONS. — Six named varieties, in not exceeding six-inch pots, Frederick L. Ames,	6 00
Second, E. W. Gilmore,	4 00
Third, David Allan,	3 00
PALM. — Single specimen, named, Samuel R. Payson, *Cocos Bonnetti*,	6 00
Second, C. H. Hovey & Co., *Pritchardia Pacifica*,	5 00
NEPENTHES. — Three plants, named, Frederick L. Ames,	6 00
AGAVES. — Six distinct named varieties, C. M. Hovey,	4 00
Second, Benjamin G. Smith,	3 00
SUCCULENTS. — Collection (other than Agaves or Yuccas) of twelve named species and varieties, C. M. Hovey,	4 00
ORCHIDS. — Six plants, named varieties, in bloom, Frederick L. Ames,	12 00

Three plants, named varieties, in bloom, E. W. Gilmore,	$8 00
Second, Frederick L. Ames,	6 00
Single plant, in bloom, Frederick L. Ames, *Epidendrum prismatocarpum*,	3 00
GLADIOLI.— Best display, and best kept during the exhibition, of named or unnamed varieties, filling one hundred bottles, H. B. Watts,	10 00
Second, James Cartwright,	8 00
Third, Edwin Sheppard,	6 00
DAHLIAS.— Twelve named varieties, Edwin Sheppard,	6 00
Second, C. L. Burr,	5 00
Six named varieties, Edwin Sheppard,	4 00
Second, John Parker,	3 00
Third, Macey Randall,	2 00
Three named varieties, Edwin Sheppard,	3 00
Single named flower, fancy or self, Edwin Sheppard,	2 00
LILIPUTIAN DAHLIAS. — General Display, filling twenty-five bottles, George S. Tuttle,	3 00
Second, Macey Randall,	2 00
Third, Charles L. Burr,	1 00
CUT FLOWERS. — Best Display, and best kept during the exhibition, filling one hundred and fifty bottles, Mrs. E. M. Gill,	16 00
Second, C. H. Hovey & Co.,	14 00
Third, W. K. Wood,	12 00
BASKET OF FLOWERS. — Best arranged, and best kept through the exhibition, James O'Brien,	6 00
Second, Mrs. David Allan,	5 00
Third, Miss Sarah W. Story,	4 00

Gratuities:—

William J. Martin (gardener to Henry P. Kidder), Greenhouse and Stove Plants,	25 00
H. H. Hunnewell, twenty-two Stove and Greenhouse Plants, and Cut Flowers,	15 00
Frederick L. Ames, thirteen Stove and Greenhouse Plants,	10 00
G. A. Nickerson, Crotons, Dracænas, and Palms, sixteen plants,	10 00
Robert. T. Jackson, Hardy Plants and Evergreens in pots,	3 00
Samuel R. Payson, Plants,	2 00
Frederick L. Ames, " and Cut Flowers,	3 00
E. W. Gilmore, " " " "	2 00
Edwin Fewkes, Dahlias, Sweet Peas, etc.,	2 00
John Parker, " etc.,	1 00
Macey Randall, "	2 00
Charles L. Burr, "	2 00
Edwin Sheppard, "	1 00
E. W. Sewall, Nasturtiums (twenty-eight varieties),	1 00
J. S. Johnson, "	1 00

C. M. Hovey, Ferns,	$2 00
" " " in Lower Hall,	2 00
Stillman S. Hovey, Asters and Marigolds,	2 00
Robert T. Jackson, "	2 00
Miss Sarah W. Story, Herbaceous Plants,	1 00
W. C. Strong, Foliage of Trees and Shrubs,	3 00
Norton Brothers, Roses,	1 00
L. W. Goodell, Cut Flowers,	3 00
John S. Richards, " "	2 00
Mrs. Francis B. Hayes, " "	1 00
Miss Emilie Ropes, " "	1 00
Miss Sarah W. Story, " "	1 00
Edwin Sheppard, " "	1 00
N. S. Simpkins, twelve cut Nymphæas,	2 00
E. D. Sturtevant, Nelumbiums and Nymphæas,	50 00
Frank H. Forbes, Bouquet of Foliage and Wild Flowers,	1 00
Mrs. P. D. Richards, Native Plants,	2 00

OCTOBER 3.

Gratuities: —

Edwin Sheppard. Single and Double Dahlias,	3 00
C. M. Hovey, Single Dahlias,	2 00
John L. Gardner, Dahlias,	2 00
John Parker, "	1 00
Stillman S. Hovey, Marigolds and Dahlias,	1 00
Miss Sarah W. Story, Cut Flowers,	2 00
Mrs. E. M. Gill, " "	1 00
Mrs. T. L. Nelson, " "	1 00
Mrs. P. D. Richards, Wild Flowers,	2 00

NOVEMBER 7.

Gratuity: —

John C. Hovey, Plant of *Helleborus niger*,	2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 12 AND 13.

CHRYSANTHEMUMS. — Six Large Flowered or Chinese, distinct named varieties, one plant in each pot, Henry P. Walcott,	$12 00
Three Large Flowered or Chinese, distinct named varieties, one plant in each pot, Henry P. Walcott,	8 00
Second, Edwin Fewkes,	6 00
Six Japanese, distinct named varieties, one plant in each pot, Henry P. Walcott,	12 00
Second, Edwin Fewkes,	10 00

Three Japanese, distinct named varieties, one plant in each pot, Henry P. Walcott, ... $8 00
Second, Henry P. Walcott, ... 6 00
Third, Edwin Fewkes, ... 4 00
Four Pompons, distinct named varieties, one plant in each pot, Henry P. Walcott, ... 8 00
Specimen Plant, Large Flowered or Chinese, named, Henry P. Walcott, Mr. Gladstone, ... 5 00
Second, Edwin Fewkes, Mr. George Glenny, ... 4 00
Specimen Plant, Japanese, named, Henry P. Walcott, Fernand Feral, ... 5 00
Second, Edwin Fewkes, Carmen, ... 4 00
Specimen Plant, Anemone, named, Henry P. Walcott, Timbale d'Argent, ... 5 00
Best display of forty named plants, in pots, all classes, not less than ten varieties, E. W. Wood, ... 25 00
Second, Edwin Fewkes, ... 20 00
Third, Patrick Malley, ... 18 00
Twelve cut blooms, Large Flowered or Chinese, named, Edwin Fewkes, ... 5 00
Second, Edwin Sheppard, ... 4 00
Twelve cut blooms, Japanese, named, Edwin Sheppard, . . . 5 00
Second, Edwin Fewkes, ... 4 00
Six cut blooms, Large Flowered or Chinese, named, Edwin Fewkes, ... 4 00
Second, Samuel Neil, ... 3 00
Six cut blooms, Japanese, named, Edwin Fewkes, ... 4 00
Second, George W. Creesy, ... 3 00
Display of twenty-four sprays, not less than twelve varieties, Large Flowered or Chinese, named, in vases, Edwin Fewkes, ... 5 00
Second, E. W. Wood, ... 4 00
Third, Edwin Sheppard, ... 3 00
Fourth, Samuel Neil, ... 2 00
Display of twenty-four sprays, not less than twelve varieties, Japanese, named, in vases, Edwin Fewkes, ... 5 00
Second, Edwin Sheppard, ... 4 00
Third, E. W. Wood, ... 3 00
Fourth, C. M. Hovey, ... 2 00
Display of twenty-four sprays, not less than twelve varieties, Pompons, named, in vases, E. W. Wood, ... 4 00
Orchids.—Three plants, named varieties, in bloom, Frederick L. Ames, ... 10 00
Second, E. W. Gilmore, ... 8 00
Third, Frederick L. Ames, ... 6 00
Fourth, E. W. Gilmore, ... 4 00

Single plant, in bloom, David Allan, *Vanda cærulea*,	$5 00
Second, Frederick L. Ames, *Cypripedium Harrisianum*	4 00
Third, E. W. Gilmore,	3 00

Gratuities: —

Mrs. Francis B. Hayes, Display of Chrysanthemums,	12 00
Norton Brothers, " "	12 00
C. M. Hovey, " "	8 00
Henry P. Walcott, three Seedling " in pots,	5 00
Edwin Fewkes, seven " " "	5 00
Patten & Co., Collection of " " cut blooms,	4 00
Warren Heustis, Ten Chrysanthemums, in pots,	4 00
J. Lewis Childs, Cut "	3 00
Henry P. Walcott, " "	2 00
Mrs. E. M. Gill, " "	3 00
Edwin Sheppard, " " and Pelargoniums, etc.,	5 00
C. M. Hovey, Greenhouse Plants,	15 00
W. A. Manda, " " cut blooms of,	3 00
" " Collection of Orchids	7 00
David Allan, " " " and Cut Flowers,	8 00
Frederick L. Ames, " " " " "	6 00
E. W. Gilmore, " " " " "	6 00
Sewall Fisher, " " Seedling Carnations,	3 00
Robert Manning, Snowberry, Coralberry, and Bittersweet,	1 00
Miss Sarah W. Story, Cut Flowers,	3 00
Stillman S. Hovey, " "	3 00
Mrs. E. M. Gill, Design,	1 00
Mrs. F. W. Webber, " in Immortelles,	1 00
Mrs. Stillman S. Hovey, Basket of Dried Flowers,	2 00
Mrs. P. D. Richards, Native Flowers and Shrubs,	4 00

DECEMBER 5.

Gratuities: —

Edwin Sheppard, Pelargoniums,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00

DECEMBER 19.

Gratuities: —

Mrs. Francis B. Hayes, Cut Flowers,	1 00
Mrs. P. D. Richards, Native Plants,	2 00

SILVER MEDALS.

January 24. Samuel R. Payson, *Cattleya labiata Percivaliana.*

" 28. Frederick L. Ames, Five-flowered spike of *Vanda Sanderiana.*

Spring Exhibition, March 19 and 20. Frederick L. Ames, *Phalænopsis Brymerianum.*

" " " " F. L. Harris (gardener to H. H. Hunnewell), for skilful culture of Orchids.

" " " " William Robinson (gardener to F. L. Ames), for skilful culture of Orchids.

" " " " David Allan (gardener to R. M. Pratt), for skilful culture of Orchids.

June 20. Mrs. Francis B. Hayes, for New Rhododendrons in 1885.

August 22. N. S. Simpkins, for skill shown in cultivating *Nymphæa rubra*, *N. Devoniensis*, *N. Zanzibarensis aurea*, *N. dentata*, etc.

Annual Exhibition, Sept. 15–18. David Allan, *Alocasia Sanderiana.*

" " " " H. H. Hunnewell, *Asparagus plumosus scandens.*

Chrysanthemum Show, Nov. 12 and 13. Henry P. Walcott, Seedling yellow Chrysanthemum B 25.

December 5. Miss S. W. Story, for Herbaceous Plants during the season of 1885.

BRONZE MEDALS.

February 28. E. M. Wood & Co., sixteen Maréchal Niel Roses; and for cultural skill.

December 5. Anthony McLaren, for Herbaceous Plants during the season of 1885.

FIRST CLASS CERTIFICATES OF MERIT.

January 24. Samuel R. Payson, six varieties of *Cattleya Trianæ.*

" 28. C. M. Hovey, Seedling Amaryllis.

February 28. Edward L. Beard, *Primula obconica.*

" 28. William H. Spooner, Hybrid Perpetual Rose Queen of Queens.

Spring Exhibition, March 19 and 20. John B. Moore & Son, New Rose Col. Felix Breton.

" " " " Edward L. Beard, Narcissus Sir Watkins.

March 28. David Allan, Double Clematis Maggie Mitchell.

April 11. Frederick L. Ames, *Lælia Philbrickiana.*

August 1. F. L. Temple, *Hypericum aureum.*

" 1. " " *Gaillardia grandiflora.*

" 1. Arthur H. Fewkes, *Milla biflora.*

" 1. John C. Hovey, *Orostachys spinosa.*

August 7. William J. Martin, gardener to Henry P. Kidder, for skill in cultivating Achimenes.

" 15. Denys Zirnglebel, eight pots of Dwarf French Asters.

September 5. Joseph Tailby, Rose William Francis Bennett.

" 5. C. M. Hovey, " Perle d' Or.

" 5. Edwin Fewkes, Heliotrope Roi des Noirs.

Annual Exhibition, September 15–18. Frederick L. Ames, *Dracæna Massangeana.*

" " " " H. H. Hunnewell, *Dracæna Massangeana.*

" " " " Frederick L. Ames, *Ataccia cristata.*

Chrysanthemum Show, November 12, 13. Henry P. Walcott, Seedling yellow Chrysanthemum C 10.

" " " " Henry P. Walcott, Seedling yellow Chrysanthemum C 56.

" " " " Frederick L. Ames, *Cypripedium tonsum*, *C. tesselatum*, and *C. porphyreum.*

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1885.

By E. W. WOOD, Chairman.

The fruit crop of the past year throughout the State has been above the average. A marked feature has been the large excess of Apples over the amount usually produced in the odd year. In many orchards in the State the crop of 1884 was destroyed by late frosts in the spring, and those orchards have borne a full crop the past season, thus very nearly equalizing the yield of these two years. Though the owners lost the crop of 1884, they have been partly recompensed, and will receive a further substantial benefit if the trees continue to produce their fruit on the odd year. In that case, our State will be amply able to furnish an annual home supply of this fruit, instead of, as now, depending upon other portions of the country in alternate years, which will be a decided gain to both producer and consumer. The supply the past season has been beyond the demand for home consumption; and from ten to twenty thousand barrels per week have been sent to foreign markets. The prices have been reasonable for consumers and fairly remunerative to the growers.

The fruit buds on the Peach trees were again destroyed the last winter. This occurred about the 20th of December, 1884, when there had been no extremely low temperature; but immediately after several successive days of cold west wind it was discovered that the buds were all killed. From this it appears that such a result does not depend altogether upon extreme cold; but may

occur from other conditions of the atmosphere. Neither the health nor vigor of the trees seems to be seriously affected, as they have made fair growth the past season, and are again well furnished with fruit buds.

STRAWBERRIES. — The crop of this fruit was above the average, and the exhibition more than usually interesting. Of the special prizes for the best four quarts of any variety, the first and second were awarded for the Sharpless; the third, for one of several new seedlings introduced by P. M. Augur & Sons, of Middlefield, Conn., called the Jewell. This variety compares more favorably with the Sharpless in size than any previously shown, and the Committee thought it better in quality; and from plants shown with the fruit it would seem to be unusually productive. It is an exceedingly strong grower, producing runners of unusual size. The fourth prize was taken by Warren Heustis, for his seedling Belmont; which fully sustained the recommendations previously given in these reports. As a late variety for market it is specially desirable. For the best seedling introduced since 1880, the Society's Silver Medal was awarded to P. M. Augur & Sons for the Jewell. For one quart of any new variety not previously exhibited, the first prize was awarded to Messrs. Augur & Sons for the Dewey; which was of fair size, good form and color, and superior in quality to any other of the new varieties shown. The second prize was awarded to W. C. Winter for the Lincoln.

There have been the usual displays of other small fruits at the weekly exhibitions; though there has been nothing new entitled to special mention.

CURRANTS have been shown in about the usual quantity. All the open prizes for Red varieties have been taken by the Versaillaise; and the prizes for White were divided between the French Transparent and Dana's Transparent.

CHERRIES were exhibited in less quantity than for several years. That this fruit is less reliable and less profitable than some of the others is shown by the fact that the larger growers give it comparatively little attention, devoting their time and space to other fruits.

RASPBERRIES were shown in about the usual quantity. The Cuthbert took the lead as a prize winner; this variety seems to have been generally adopted by the growers. This fruit deserves more

attention; it is easily grown, and meets with ready sale at fairly remunerative prices.

BLACKBERRIES. — The prizes for this fruit were all awarded to the Dorchester. While this variety has proved the most desirable for exhibition purposes, there are others equally if not more desirable for general cultivation. It is claimed for the Kittatinny that it is more hardy, a good cropper, and produces good-sized, saleable fruit.

GOOSEBERRIES were shown in limited quantity. They are grown to less extent than any other of the small fruits. The prizes were given to the Downing and Smith's Improved, for Natives; and to the Whitesmith and Bang-Up, for Foreign.

PLUMS were shown in large quantity and variety, forming an interesting feature of the weekly and annual exhibitions. The most serious obstacle to growing this fruit is the black wart; and the only remedy for this disease, thus far discovered, is cutting it out immediately upon its appearance, — a process which often disfigures and not unfrequently destroys valuable trees.

PEACHES. — The frequent failure of this fruit within the last few years has discouraged the larger growers; and, at least for the immediate future, its cultivation will be confined mostly to the private garden, where a few trees may be planted every year. The fact that this fruit is now frequently destroyed by winters less severe than it endured in former years, when abundant crops were produced, would indicate that the trees have become less vigorous and hardy. Whether any improvement can be secured by greater care in selecting pits and buds from healthy trees, is a subject worthy of consideration.

GRAPES. — It has been an exceptionally favorable season for this fruit. There has been very little mildew, and the continued mild weather in October gave plenty of time to ripen and gather the crop. The competition for the prizes has been larger than for several years; and the specimens exhibited have been of superior quality.

FOREIGN GRAPES. — The display of this fruit at the annual exhibition by David Allan was the finest that has ever come under the examination of the present Committee. The size, color, and finish of some of the bunches have rarely if ever been equalled at any previous exhibitions of the Society.

Pears have been abundant, and the exhibitions have been well sustained through the season; and the competition on some of the more popular varieties has been so great that the Committee have been unable to recognize properly all that were offered. There have been some complaints among growers at the prices realized; but those who have had well-grown fruit of such varieties as the trade demanded, when they compare the prices with those of other articles, either of luxury or necessity, have little cause for complaint. The opportunity supplied by the cold-storage houses for extending the season of some of the earlier pears has been of great advantage to the growers. All the better varieties of October pears could be furnished in perfect condition for the Thanksgiving dinner.

Apples. — As already stated above, there has not, certainly for many years, been so large a crop of apples on the odd year as was gathered the past season. At this year's Annual Exhibition, for the first time in the history of our Society, the prizes offered for this fruit were nearly all awarded.

In addition to the displays at regular exhibitions, specimens have been received and placed upon the tables in the Library Room, for exhibition, as follows: —

A. L. Hitchcock sent a cluster of Grape Fruit received from Florida, resembling Shaddocks, but growing in clusters. This is the *Citrus pompelmos racemosus* of Risso and Poiteau.

There were received from the Maine Pomological Society forty-three varieties of Apples, comprising the most popular kinds grown in that State, many of which were familiar to and are grown by our own exhibitors.

A collection of Apples was received, through Hon. Marshall P. Wilder, from Nebraska. They were very smooth and fair, and of large size; but hardly in condition to afford a fair test of quality.

A dish of Seedling Apples was received from John F. Jones, Contoocook, N.H. They were of large size, perfect form, and a deep bright red color throughout; of fair quality, and would make a very attractive market variety.

Of fruits previously entered for the Prospective Prizes, the Hayes Grape and the Belmont Strawberry were the only ones to which the attention of the Committee has been called. P. M.

Augur & Sons have this year entered their Seedling Strawberry, Jewell, for the Prospective Prize for that fruit.

Of the $1,500 appropriated for prizes and gratuities for fruits, the Committee have awarded $1,225, leaving a balance of $275. A considerable portion of this balance represents prizes offered for peaches, but not awarded, owing to the failure of the crop, and the consequent absence of competition.

The increased appropriation for next year has enabled the Committee to offer new prizes; and also to add materially to the old ones, especially for those fruits in which there is the strongest competition; and they feel confident that these measures will result in an accession of new exhibitors, and in more assiduous efforts on the part of our habitual contributors, thus making our exhibitions what they should be,— sources of continually increasing interest and instruction.

E. W. Wood,
Benj. G. Smith,
Jacob W. Manning,
C. F. Curtis,
O. B. Hadwen,
Warren Fenno,
Committee on Fruits.

PREMIUMS AND GRATUITIES AWARDED FOR FRUITS.

FEBRUARY 21.

Gratuity: —

Asa Clement, Lady's Sweet Apples,	$1 00

SPRING EXHIBITION.

MARCH 19 AND 20.

WINTER PEARS. — A. J. Bigelow, Anjou,	$3 00
Second, Mary Gardner, Easter Beurre,	2 00
WINTER APPLES. — William T. Hall, Northern Spy,	3 00
Second, C. Terry, Baldwin,	2 00
STRAWBERRIES. — One pint, T. N. Vail, Sharpless,	3 00

Gratuities: —

C. C. Balch, Lemons and Oranges,	2 00
A. S. McIntosh, Apples and Pears,	2 00
Mrs. H. V. Draper, Pears,	1 00
Robert Manning, "	1 00
C. Sumner Jacobs, Apples,	1 00
B. G. Smith, Collection,	2 00
C. W. Grant, "	1 00
Warren Fenno, "	1 00

APRIL 4.

Gratuity: —

T. N. Vail, Sharpless Strawberries,	2 00

APRIL 18.

Gratuity: —

William H. Hunt, Hunt Russet Apples,	1 00

MAY 9.

Gratuity: —

George Hill, Sharpless Strawberries,	1 00

JUNE 13.

Gratuity: —

O. B. Hadwen, Apples,	1 00

JUNE 20.

Gratuities: —

Asa Clement, Apples,	$1 00
William Doran & Son, Strawberries,	1 00
John B. Moore & Son, "	1 00
C. E. Grant, "	1 00
George Hill, "	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 25 AND 26.

Special Prizes.

STRAWBERRIES.— Four quarts of any variety, George Hill, Sharpless, Silver Cup, value,	$20 00
Second, George V. Fletcher, Sharpless,	15 00
Third, P. M. Augur & Sons, Jewell,	10 00
Fourth, Warren Heustis, Belmont,	5 00

Best Exhibition of a Seedling Strawberry introduced within the last five years, P. M. Augur & Sons, Jewell, Silver Medal.

Regular Prizes.

STRAWBERRIES.— Forty-eight berries of Bidwell, George V. Fletcher,	4 00
Second, William Patterson,	3 00
Charles Downing, E. W. Wood,	4 00
Second, C. M. Hovey,	3 00
Third, Joseph D. Fitts,	2 00
Cumberland, Benjamin G. Smith,	4 00
Second, J. D. Fitts,	3 00
Hervey Davis, E. W. Wood,	4 00
Second, John B. Moore & Son,	3 00
Third, B. G. Smith,	2 00
Hovey, the third prize to C. M. Hovey,	2 00
Jucunda, C. E. Grant,	4 00
Miner's Prolific, the second prize to J. D. Fitts,	3 00
Seth Boyden, the second prize to E. W. Wood,	3 00
Sharpless, George Hill,	4 00
Second, John B. Moore & Son,	3 00
Twenty-four berries of Bidwell, the second prize to J. D. Fitts,	2 00
Champion, the second prize to J. D. Fitts,	2 00
Charles Downing, E. W. Wood,	3 00
Second, B. G. Smith,	2 00
Crescent, B. Judkins,	3 00
Second, L. W. Weston,	2 00
Cumberland, William Patterson,	3 00
Second, Warren Heustis,	2 00

Hervey Davis, E. W. Wood,	$3 00
Second, John B. Moore & Son,	2 00
Jersey Queen, C. M. Hovey,	3 00
Second, J. D. Fitts,	2 00
Manchester, Warren Heustis,	3 00
Second, J. D. Fitts,	2 00
Miner's Prolific, the second prize to L. W. Weston,	2 00
Seth Boyden, E. W. Wood,	3 00
Sharpless, George Hill,	3 00
Second, William Patterson,	2 00
Any other variety, C. E. Grant, Longfellow,	3 00
Second, William C. Winter, Seedling No. 10,	2 00
Third, John L. Gardner, James Vick,	1 00
Collection, not less than six varieties, J. D. Fitts,	4 00
One quart of any new variety, P. M. Augur & Sons, Dewey,	3 00
Second, William C. Winter, Lincoln,	2 00
CHERRIES.— Two quarts of any variety, S. Lockwood, Black Tartarian,	2 00
FOREIGN GRAPES.— Two bunches of any variety, E. S. Converse, Black Hamburg,	5 00
FORCED PEACHES.— Six specimens of any variety, William C. Winter,	3 00

Gratuities:—

E. S. Converse, Foreign Grapes,	2 00
C. E. Grant, Strawberries,	2 00

JULY 11.

STRAWBERRIES.— Twenty-four berries of any variety, Warren Heustis, Belmont,	3 00
Second, C. E. Grant, Longfellow,	2 00
Third, Warren Heustis, Middlesex,	1 00
CHERRIES.— Two quarts of Downer's Late, M. W. Chadbourne,	2 00
Second, C. N. Brackett,	1 00
Any other variety, Warren Fenno, Norfolk,	2 00
RASPBERRIES.— Two quarts of any variety, C. E. Grant, Herstine,	3 00
Second, William Doran & Son, Highland Hardy,	2 00
CURRANTS.— Forty-eight bunches of any Red variety, B. G. Smith, Versaillaise,	4 00
Second, M. W. Chadbourne, Versaillaise,	3 00
Third, William Doran & Son, "	2 00

Gratuities:—

S. Lockwood, Cherries,	2 00
M. W. Chadbourne, Collection,	1 00

JULY 18.

RASPBERRIES.— Collection of not less than four varieties, two quarts of each, William Doran & Son, ... $4 00
Second, C. E. Grant, ... 3 00
Two quarts of any variety, John B. Moore & Son, Souchetti, . 3 00
Second, B. Judkins, Cuthbert, ... 2 00
CURRANTS.— Twenty-four bunches of Versaillaise, B. G. Smith, 2 00
Second, W. K. Wood, ... 1 00
Any other Red variety, B. G. Smith, Fay's Prolific, . . . 2 00
Second, B. G. Smith, Victoria, ... 1 00

Gratuities:—

C. E. Grant, Strawberries, ... 1 00
Warren Heustis, " 1 00
C. N. Brackett, Cherries, ... 1 00
S. Lockwood, " 1 00
Warren Fenno, " 1 00

JULY 25.

RASPBERRIES.— Two quarts of any variety, C. E. Grant, Cuthbert, 2 00
Second, B. Judkins, Cuthbert, ... 1 00
CURRANTS.— Twenty-four bunches of any Red variety, B. G. Smith, Versaillaise, ... 3 00
Second, Mrs. E. M. Gill, Versaillaise, ... 2 00
Third, W. K. Wood, " 1 00
Any White variety, B. G. Smith, Dana's Transparent, . . 2 00
Second, B. G. Smith, French Transparent, ... 1 00
GOOSEBERRIES.— Two quarts of any Native variety, M. W. Chadbourne, Downing, ... 3 00
Second, B. G. Smith, Smith's Improved, ... 2 00

Gratuities:—

M. W. Chadbourne, Currants, ... 1 00
Warren Heustis, " 1 00
Warren Fenno, Gooseberries, ... 1 00
C. E. Grant, Raspberries, ... 1 00

AUGUST 1.

BLACKBERRIES.— Two quarts of any variety, A. S. McIntosh, Dorchester, ... 3 00
Second, M. W. Chadbourne, Dorchester. 2 00
Third, L. W. Weston, " 1 00
GOOSEBERRIES.— Two quarts of Foreign, B. G. Smith, Whitesmith, ... 2 00
Second, B. G. Smith, Bang-Up, ... 1 00

PEARS.— Summer Doyenne, Horace Eaton,	$3 00
Second, Warren Fenno,	2 00
Third, B. G. Smith,	1 00
Any other variety, A. S. McIntosh, Madeleine,	3 00
Second, A. W. Nelson, "	2 00
Third, Warren Fenno, "	1 00

Gratuities:—

C. E. Grant, Raspberries,	1 00
Warren Fenno, Gooseberries,	2 00
M. W. Chadbourne, " and Currants,	1 00
Marshall P. Wilder, Seedling Gooseberry,	1 00

AUGUST 8.

APPLES.— Sweet Bough, Warren Heustis,	2 00
Second, Warren Fenno,	1 00
Any other variety, Charles F. Curtis, Williams,	2 00
Warren Fenno, Red Astrachan,	1 00
PEARS.— Giffard, John L. Bird,	3 00
Second, Charles F. Curtis,	2 00
Third, B. G. Smith,	1 00
Any other variety, B. G. Smith, Jargonelle,	2 00
Second, M. W. Chadbourne, Osband's Summer,	1 00

Gratuities:—

B. G. Smith, Gooseberries and Blackberries,	1 00
A. S. McIntosh, Blackberries,	1 00
B. C. Vose, "	1 00
M. W. Chadbourne, Collection,	1 00
C. E. Grant, "	1 00

AUGUST 15.

APPLES.— Oldenburg, C. C. Shaw,	3 00
Second, Warren Fenno,	2 00
Red Astrachan, C. C. Shaw,	3 00
Second, Horace Eaton,	2 00
Third, Warren Fenno,	1 00
Williams, Charles F. Curtis,	3 00
Second, Asa Clement,	2 00
Third, Josiah Crosby,	1 00
PEARS.— Clapp's Favorite, Horace Eaton,	3 00
Second, John L. Bird,	2 00
Third, C. S. Hosmer,	1 00
Manning's Elizabeth, Mrs. Mary Langmaid,	2 00
Second, Warren Fenno,	1 00
Any other variety, George Frost, Quimper,	2 00
Second, C. N. Brackett, Brandywine,	1 00

FOREIGN GRAPES.—Two bunches of any variety, David Allan, Black Hamburg, ... $5 00
Second, John S. Farlow, Cannon Hall Muscat, . . . 4 00

Gratuity:—

Warren Fenno, Collection, ... 1 00

AUGUST 22.

PEARS.—Bartlett, George S. Harwood, ... 3 00
Second, Samuel Hartwell, ... 2 00
Third, C. N. Brackett, ... 1 00
Rostiezer, George S. Harwood, ... 2 00
Second, C. N. Brackett, ... 1 00
Tyson, A. S. McIntosh, ... 2 00
Second, Samuel McIntosh, ... 1 00
Any other variety, C. M. Hovey, Clapp's Favorite, . . . 2 00
Second, Warren Heustis, " " . . . 1 00
PEACHES.—Any variety, Warren Fenno, Hale's Early, . . . 3 00

Gratuities:—

Warren Fenno, Pears and Apples, ... 2 00
M. W. Chadbourne, Pears, ... 1 00
A. S. McIntosh, " 1 00

AUGUST 29.

APPLES.—Any variety, Samuel Hartwell, Williams, . . . 3 00
Second, B. G. Smith, " . . . 2 00
Third, Warren Heustis, ... 1 00
PEARS.—Bartlett, George S. Harwood, ... 3 00
Second, Mrs. A. M. Winn, ... 2 00
Third, Samuel Hartwell, ... 1 00
Any other variety, A. McDermott, Clapp's Favorite, . . . 2 00
Second, A. S. McIntosh, Tyson, ... 1 00
PLUMS.—Any variety, John B. Moore & Son, Washington, . . 3 00
Second, Samuel Hartwell, Niagara. 2 00
Third, B. G. Smith, Bradshaw, ... 1 00
NATIVE GRAPES.—Six bunches of any variety, Samuel Hartwell, Moore's Early, ... 3 00
Second, B. G. Smith, Champion, ... 2 00
Third, C. N. Brackett, " 1 00

Gratuities:—

B. G. Smith, Grapes, ... 1 00
Mrs. H. V. Draper, Plums, ... 1 00
Horace Partridge, Grapes, ... 1 00
John C. Park, Crab Apples, ... 1 00
Warren Fenno, Collection, ... 1 00
M. W. Chadbourne, " 1 00

SEPTEMBER 5.

APPLES.— Foundling, L. W. Weston,	$3 00
Second, Warren Fenno,	2 00
Gravenstein, Frank Smith,	3 00
Second, Samuel Hartwell,	2 00
Third, Warren Heustis,	1 00
Porter, Samuel Hartwell,	3 00
Second, C. W. Grant,	2 00
Third, Mrs. A. M. Winn,	1 00
Any other variety, Mrs. M. A. Fullick, Williams,	2 00
Second, Samuel Hartwell, Sparhawk,	1 00
PEARS. —Andrews, Mrs. Mary Langmaid,	2 00
Second, B. G. Smith,	1 00
Boussock, George S. Harwood,	2 00
Second, Horace Eaton,	1 00
Any other variety, William H. Hunt, Clapp's Favorite,	2 00
Second, S. Lockwood, " "	1 00
PLUMS.—Collection of not less than four varieties, Samuel Hartwell,	3 00
Second, Horace Eaton,	2 00
Third L. W. Goodell,	1 00
Any other variety, F. J. Dutcher, McLaughlin,	2 00
Second, Samuel Hartwell,	1 00
NATIVE GRAPES.— Six bunches of Hartford, Cephas H. Brackett,	3 00
Moore's Early, John B. Moore & Son,	3 00
Second, Samuel Hartwell,	2 00
Any other variety, B. G. Smith, Cottage,	3 00
Second, B. G. Smith, Ives's Seedling,	2 00

Gratuities: —

M. W. Chadbourne, Collection,	1 00
Samuel Hartwell, "	1 00

ANNUAL EXHIBITION.

SEPTEMBER 15, 16, 17, AND 18.

Special Prizes.

Twelve Gravenstein Apples, C. C. Shaw,	$5 00
Twelve Bartlett Pears, Mrs. Mary Langmaid,	5 00
Twelve bunches of Native Grapes, of any variety, John B. Moore & Son, Moore's Early,	5 00
For the heaviest and best ripened bunch of any Foreign Black Grape, not less than five pounds, David Allan, Alnwick Seedling,	8 00
For the heaviest and best ripened bunch of any Foreign White Grape, not less than five pounds, David Allan, Syrian,	8 00

Regular Prizes.

APPLES.— Baldwin, C. C. Shaw,	$4 00
Second, Samuel Hartwell,	3 00
Third, L. W. Weston,	2 00
Danvers Sweet, C. C. Shaw,	2 00
Second, J. T. Foster,	1 00
Fall Orange or Holden, Samuel Hartwell,	3 00
Second, C. W. Grant,	2 00
Fameuse, Horace Eaton,	3 00
Second, George V. Fletcher,	2 00
Foundling, Warren Fenno,	4 00
Second, L. W. Weston,	3 00
Garden Royal, J. C. McNeil,	3 00
Second, Samuel Hartwell,	2 00
Golden Russet, the second prize to Warren Fenno,	1 00
Gravenstein, Samuel Hartwell,	4 00
Second, Charles H. Stearns,	3 00
Third, Warren Heustis,	2 00
Hubbardston, C. N. Brackett,	4 00
Second, L. W. Weston,	3 00
Third, Josiah Crosby,	2 00
Hunt Russet, Samuel Hartwell,	3 00
Lady's Sweet, Warren Fenno,	2 00
Leicester, the second prize to O. B. Hadwen,	1 00
Lyscom, Samuel Hartwell,	2 00
Second, C. W. Grant,	1 00
Maiden's Blush, C. C. Shaw,	2 00
Second, Mrs. A. M. Winn,	1 00
Northern Spy, Warren Fenno,	3 00
Second, C. C. Shaw,	2 00
Third, W. A. Morse,	1 00
Porter, C. C. Shaw,	3 00
Second, Francis Smith,	2 00
Pumpkin Sweet, Samuel Hartwell,	2 00
Second, George W. Stearns,	1 00
Rhode Island Greening, C. N. Brackett,	4 00
Second, W. C. Eustis,	3 00
Roxbury Russet. L. W. Goodell,	4 00
Second, John L. D'Wolf,	3 00
Third, C. C. Shaw,	2 00
Tolman's Sweet, C. C. Shaw,	3 00
Second, J. T. Foster,	2 00
Third, Josiah Crosby,	1 00
Tompkins King, W. A. Morse,	3 00
Second, C. C. Shaw,	2 00
Washington Royal, Samuel Hartwell,	3 00
Second, O. B. Hadwen,	2 00

Washington Strawberry, Warren Fenno,	$2 00
Any other variety, George M. Stearns, Chenango,	3 00
Second, C. C. Shaw, Oldenburg,	2 00
Third, C. C. Shaw, Sudbury Sweet,	1 00
CRAB APPLES. — Twenty-four specimens of Hyslop, Cephas H. Brackett,	2 00
Second, B. Judkins,	1 00
Transcendent, C. H. Brackett,	2 00
Second, Samuel Hartwell,	1 00
PEARS. — Angouleme, John McClure,	4 00
Second, Edwin A. Hall,	3 00
Third, W. P. Walker,	2 00
Anjou, Mrs. Mary Langmaid,	4 00
Second, John McClure,	3 00
Third, C. N. Brackett,	2 00
Fourth, E. W. Wood,	1 00
Bartlett, John McClure,	4 00
Second, Mrs. Mary Langmaid,	3 00
Third, N. D. Harrington,	2 00
Fourth, A. S. McIntosh,	1 00
Belle Lucrative, Mrs. Mary Langmaid,	2 00
Second, Warren Heustis,	1 00
Bosc, George S. Curtis,	4 00
Second, Mrs. Mary Langmaid,	3 00
Third, W. P. Walker,	2 00
Fourth, George S. Harwood,	1 00
Boussock, John B. Turner,	2 00
Second, Marshall P. Wilder,	1 00
Clairgeau, Mrs. Mary Langmaid,	3 00
Second, W. P. Plimpton,	2 00
Third, Charles F. Curtis,	1 00
Comice, George S. Harwood,	3 00
Second, Horace Eaton,	2 00
Third, Warren Fenno,	1 00
Dana's Hovey, M. W. Chadbourne,	4 00
Second, George Frost,	3 00
Third, Warren Fenno,	2 00
Diel, Marshall P. Wilder,	3 00
Second, George Newmarsh,	2 00
Goodale, O. B. Hadwen,	2 00
Second, Marshall P. Wilder,	1 00
Hardy, C. F. Curtis,	3 00
Second, A. S. McIntosh,	2 00
Howell, E. W. Wood,	2 00
Second, C. E. Richardson,	1 00
Lawrence, Mrs. Mary Langmaid,	3 00
Second, C. N. Brackett,	2 00

Louise Bonne of Jersey, B. G. Smith,	$3 00
Second, George S. Harwood,	2 00
Marie Louise, John L. D'Wolf,	2 00
Second, A. S. McIntosh,	1 00
Merriam, John L. D'Wolf,	3 00
Second, Warren Fenno,	2 00
Onondaga, Warren Fenno,	2 00
Second, Marshall P. Wilder,	1 00
Paradise of Autumn, C. M. Hovey,	3 00
Second, Marshall P. Wilder,	2 00
Seckel, George S. Harwood,	4 00
Second, Samuel Hartwell,	3 00
Third, Warren Fenno,	2 00
Sheldon, George S. Harwood,	4 00
Second, Cephas H. Brackett,	3 00
Third, C. F. Curtis,	2 00
Souvenir du Congrès, C. N. Brackett,	2 00
Second, Warren Fenno,	1 00
St. Michael Archangel, Warren Heustis,	3 00
Second, T. M. Davis,	2 00
Superfin, Warren Fenno,	2 00
Second, A. S. McIntosh,	1 00
Urbaniste, A. S. McIntosh,	3 00
Second, John L. Bird,	2 00
Vicar, A. S. McIntosh,	2 00
Second, S. Lockwood,	1 00
Winter Nelis, W. P. Walker,	2 00
Second, E. W. Wood,	1 00
Any other variety, Warren Fenno, De Tongres,	3 00
Second, Horace Eaton, Frederick Clapp,	2 00
Third, A. S. McIntosh, Kingsessing,	1 00
PEACHES. — Any variety, Warren Fenno, Seedling,	3 00
NECTARINES. — Any variety, Warren Fenno,	2 00
PLUMS. — Not less than four varieties, Samuel Hartwell,	5 00
Second, Horace Eaton,	4 00
Third, John B Moore & Son,	3 00
Any other variety, Samuel Hartwell, Jefferson,	3 00
Second, F. J. Dutcher, McLaughlin,	2 00
Third, F. J. Dutcher, Green Gage,	1 00
NATIVE GRAPES. — Six bunches of Concord, Cephas H. Brackett,	3 00
Second, Marshall P. Wilder,	2 00
Delaware, Cephas H. Brackett,	3 00
Second, Joseph S. Chase,	2 00
Third, Horace Eaton,	1 00
Massasoit, John B. Moore & Son,	3 00
Second, Cephas H. Brackett,	2 00
Third, Joseph S. Chase,	1 00

Moore's Early, John B. Moore & Son,	$3 00
Second, Charles Williams,	2 00
Third, Samuel Hartwell,	1 00
Wilder, John B. Moore & Son,	3 00
Second, Marshall P. Wilder,	2 00
Worden, John B. Moore & Son,	3 00
Second, Samuel Hartwell,	2 00
Third, B. Judkins,	1 00
Any other variety, B. G. Smith, Lindley,	3 00
Second, Marshall P. Wilder, Niagara,	2 00
Third, Samuel Hartwell, Cottage,	1 00
FOREIGN GRAPES.— Four varieties, two bunches of each, David Allan,	10 00
Third prize, E. H. Luke,	6 00
Fourth, B. G. Smith,	4 00
Two bunches of Black Hamburg, David Allan,	5 00
Wilmot's Black Hamburg, the third prize to B. G. Smith,	3 00
Muscat of Alexandria, David Allan,	5 00
Any other variety, David Allan, Lady Downes,	5 00
The third prize to E. H. Luke, Golden Hamburg,	3 00
CRANBERRIES.— Half peck, Dwight C. Robbins,	2 00
Second, C. W. Grant,	1 00
Gratuities:—	
Albert Bresee, Apples,	1 00
C. W. Grant, "	1 00
M. W. Chadbourne, Apples and Pears,	3 00
W. A. Morse, " " "	2 00
C. N. Brackett, Pears,	2 00
Marshall P. Wilder, "	2 00
Warren Fenno, "	2 00
Mrs. W. A. Winn, "	1 00
Stillman S. Hovey, "	1 00
Michael Finegan, "	1 00
B. G. Smith, "	1 00
C. H. Johnson, "	1 00
William H. Hunt, " and Quinces,	1 00
William C. Strong, Grapes,	2 00
John B. Moore & Son, "	2 00
Marshall P. Wilder, "	2 00
A. J. Tillson, Pocklington Grapes,	1 00
Edmund D. Sturtevant, Papaws (*Asimina triloba*),	1 00
H. L. Barnes, Osage Oranges,	2 00

SEPTEMBER 26.

Gratuity:—	
Samuel Hartwell, Apples,	2 00

OCTOBER 8.

APPLES.— Gravenstein, Francis Smith,	$3 00
Second, William T. Hall,	2 00
Third, Samuel Hartwell,	1 00
Fall Orange, Samuel Hartwell,	3 00
Second, C. W. Grant,	2 00
Porter, Edmund F. Knight,	3 00
Second, William Patterson,	2 00
Any other variety, M. W. Chadbourne, Hubbardston,	3 00
Second, Warren Fenno, Queen,	2 00
PEARS.— Angouleme, W. S. Janvrin,	3 00
Second, S. G. Damon,	2 00
Third, John McClure,	1 00
Bosc, Mrs. Mary Langmaid,	3 00
Second, W. P. Walker,	2 00
Third, W. S. Janvrin,	1 00
Clairgeau, William T. Hall,	3 00
Second, S. G. Damon,	2 00
Third, Warren Fenno,	1 00
Comice, George S. Harwood,	3 00
Second, Horace Eaton,	2 00
Third, Warren Fenno,	1 00
Frederick Clapp, Horace Eaton,	3 00
Louise Bonne of Jersey, B. G. Smith,	3 00
Second, T. M. Davis,	2 00
Third, Mrs. A. M. Winn,	1 00
Seckel, George S. Harwood,	3 00
Second, N. D. Harrington,	2 00
Third, W. C. Eustis,	1 00
Sheldon, W. S. Janvrin,	3 00
Second, J. W. Knowles,	2 00
Third, John L. Bird,	1 00
Superfin, George H. Dickerman,	3 00
Second, Warren Fenno,	2 00
Third, A. S. McIntosh,	1 00
Urbaniste, A. S. McIntosh,	3 00
Second, M. W. Chadbourne,	2 00
Third, Warren Fenno,	1 00
Any other variety, Warren Fenno, De Tongres,	3 00
Second, A. S. McIntosh, Marie Louise,	2 00
Third, George H. Dickerman, Howell,	1 00
QUINCES.— B. G. Smith,	2 00
Second, Mrs. M. T. Goddard,	1 00
PEACHES.— Any variety, Warren Fenno,	3 00
Second, N. D. Harrington,	2 00

NATIVE GRAPES.— Six bunches of Brighton, Joseph S. Chase,	$3 00
Second, B. G. Smith,	2 00
Third, S. G. Damon,	1 00
Concord, A. J. Bigelow,	3 00
Second, J. P. Hayward,	2 00
Third, S. G. Damon,	1 00
Delaware, G. B. Andrews,	3 00
Third prize, Horace Eaton,	1 00
Iona, Horace Eaton,	3 00
Second, F. H. Perry,	2 00
Third, B. G. Smith,	1 00
Isabella, S. G. Stone,	3 00
Second, J. P. Hayward,	2 00
Third, B. G. Smith,	1 00
Massasoit, John B. Moore & Son,	3 00
Second, S. G. Damon,	2 00
Third, Cephas H. Brackett,	1 00
Moore's Early, John B. Moore & Son,	3 00
Second, Samuel Hartwell,	2 00
Prentiss, Joseph S. Chase,	3 00
Second, F. J. Dutcher,	2 00
Wilder, J. P. Hayward,	3 00
Second, John B. Moore & Son,	2 00
Third, S. G. Damon,	1 00
Any other variety, John B. Moore & Son, Hayes,	3 00
Second, J. P. Hayward, Worden,	2 00
Third, B. G. Smith, Lindley,	1 00
FOREIGN GRAPES.— Two bunches of any variety, J. P. Hayward, Muscat Hamburg,	4 00
Second, J. P. Hayward, Black Hamburg,	3 00
Third, J. P. Hayward, Syrian,	2 00

Gratuities: —

Samuel Hartwell, Apples,	2 00
C. N. Brackett, Pears,	2 00
A. S. McIntosh, "	2 00
B. G. Smith, "	1 00
M. W. Chadbourne, "	1 00
Warren Fenno, "	1 00
S. G. Damon, Apples and Pears,	2 00
G. B. Andrews, Concord Grapes,	1 00
C. W. Grant, Cranberries,	1 00

OCTOBER 10.

Gratuities: —

John F. Jones, Apples,	1 00
Robert Manning, Pears,	1 00
Clifton H. Paige, "	1 00

OCTOBER 17.

Gratuity:—

N. D. Harrington, Pears, ... $1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 12 AND 13.

French Premiums.

APPLES.—Baldwin, C. C. Shaw, ... $2 00
Second, Samuel Hartwell, ... 1 00
Danvers Sweet, C. C. Shaw, ... 2 00
Second, J. T. Foster, ... 1 00
Hubbardston, M. W. Chadbourne, ... 2 00
Second, William T. Hall, ... 1 00
Hunt Russet, C. W. Grant, ... 2 00
Second, Samuel Hartwell, ... 1 00
Lady's Sweet, Warren Fenno, ... 2 00
Northern Spy, William T. Hall, ... 2 00
Second, Warren Fenno, ... 1 00
Rhode Island Greening, A. S. McIntosh, ... 2 00
Second, Samuel McIntosh, ... 1 00
Roxbury Russet, Cephas H. Brackett, ... 2 00
Second, L. W. Goodell, ... 1 00
Tolman's Sweet, C. C. Shaw, ... 2 00
Second, J. T. Foster, ... 1 00
Tompkins King, John Parker, ... 2 00
Second, James H. Clapp, ... 1 00

Society's Prizes.

PEARS.—Angouleme, S. G. Damon, ... 3 00
Second, Varnum Frost, ... 2 00
Third, T. M. Davis, ... 1 00
Anjou, William T. Hall, ... 3 00
Second, S. G. Damon, ... 2 00
Third, Warren Fenno, ... 1 00
Comice, George S. Harwood, ... 3 00
Second, Warren Fenno, ... 2 00
Third, John McClure, ... 1 00
Dana's Hovey, John B. Moore & Son. 3 00
Second, Warren Fenno, ... 2 00
Third, M. W. Chadbourne, ... 1 00
Glout Morceau, John L. Bird, ... 3 00
Second, Warren Fenno, ... 2 00
Third, Mary Gardner, ... 1 00

Josephine of Malines, Warren Fenno,	$3 00
Second, B. G. Smith,	2 00
Third, John L. Bird,	1 00
Langelier, S. G. Damon,	3 00
Second, A. S. McIntosh,	2 00
Third, John L. Bird,	1 00
Lawrence, Andrew McDermott,	3 00
Second, John McClure,	2 00
Third, William T. Hall,	1 00
Vicar, A. S. McIntosh,	3 00
Second, William T. Hall,	2 00
Third, Samuel McIntosh,	1 00
Winter Nelis, Andrew McDermott,	3 00
Second, Jesse Haley,	2 00
Third, E. W. Wood,	1 00
Any other variety, S. G. Damon, Diel,	3 00
Second, B. G. Smith, "	2 00
Third, S. G. Damon, Clairgeau,	1 00

Gratuities:—

C. W. Grant, Apples,	2 00
Mrs. M. T. Goddard, "	1 00
A. S. McIntosh, Pears,	3 00
J. P. Knight, Seedling Japanese Pears,	1 00
C. N. Brackett, Apples and Pears,	1 00
Warren Fenno, " " "	2 00
George Seaverns, Quinces,	1 00
R. Manning, "	1 00
John Parker, "	1 00
John B. Moore & Son, Grapes,	1 00
C. Terry, "	1 00
S. G. Damon, "	1 00
George W. Holden, "	1 00
M. W. Chadbourne, Collection,	2 00

NOVEMBER 28.

Gratuities:—

T. Putnam Symonds, Apples and Pears,	2 00
Joseph S. Chase, Grapes,	1 00

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1885.

By CHARLES N. BRACKETT, Chairman.

In submitting the following report, your Committee have the pleasure of being able to say that the various vegetable exhibits throughout the season have been equal in quality to those of any previous year. The quantity shown at the Annual Exhibition was perhaps not quite so great as in some former seasons, yet any deficiency in this respect was we think more than made up by the variety and superior quality of the exhibits.

The Committee cannot but congratulate the Society on the good results thus far attained in the department with which they are connected. There has been an advance in quality from year to year in the vegetables exhibited, a constantly increasing interest on the part of the competitors for its prizes, and a more general attendance at its exhibitions by the public. When in these exhibitions, familiar vegetables display from year to year a continually improving standard of quality, we may safely attribute this continued increase in excellence rather to improved methods of cultivation, than to transient and accidental circumstances, or to exceptional conditions of soil or season.

The policy of offering prizes instead of awarding gratuities, has justified our favorable expectation during the past season. In forced vegetables, during the months of January and February, we had upon our tables more than double the quantity of exhibits ever before seen at that period of the year. Many of the speci-

mens were such as could hardly be excelled, and all were noteworthy products of skilful cultivation. The high praise which was accorded them is good evidence of the value set upon this branch of our exhibitions. The money value of the prizes is small; that alone cannot be the impelling motive. Rather the spirit of rivalry among contributors, which springs from comparing individual results, and the visibly increasing public interest manifested in our exhibitions, have resulted in giving us a higher standard of excellence in our products, and are important elements in our success.

For much of the interest attending the weekly exhibitions, especially those of the earlier part of the season, the Society is under obligations to Messrs. George Hill, Cephas H. Brackett, W. W. Rawson, George F. Stone, William D. Philbrick, Josiah Crosby, Mrs. Francis B. Hayes, and others, who have made frequent exhibition of forced vegetables in great variety. Their contributions consisted of Cucumbers, Radishes, Lettuce, Mushrooms, Brussels Sprouts, Dandelions, Rhubarb, Asparagus, Tomatoes, and Parsley. The especially fine specimens of Asparagus and Rhubarb shown February 7, were from Mrs. Francis B. Hayes. As a very successful cultivator of the Mushroom, Cephas H. Brackett has for several seasons won distinction. He has uniformly shown the best specimens, and taken the first prizes. To judge from the character of the exhibits he has made, he evidently believes that "if a thing is worth doing at all it is worth doing well." We have certainly seen abundant proofs of this at frequent exhibitions, and of his skill in producing only the choicest and best specimens of whatever he undertakes to grow. As a contributor of forced vegetables he has shown a commendable zeal in sustaining our winter and early spring shows. Now that we are to have, in the coming season, a full list of prizes for vegetables grown under glass, we have ground for hoping that this important and very rapidly increasing branch of horticulture will become a yet more prominent feature in our exhibitions.

The liberal increase in the amount placed at the disposal of the Committee, for prizes and gratuities during the coming year, has enabled them to offer a list of premiums for forced vegetables to be shown in the month of April, and also to make other and important additions and alterations in the Schedule. A glance at the prize list for 1886 will show an appropriation of $1,000 for

vegetables. This is an increase on the appropriation of the past year of $200, and shows not only that the Society fully recognizes the present usefulness and importance of this branch of horticulture, but that it has a distinct purpose and a progressive policy in thus further encouraging and stimulating the efforts of those engaged in it.

Most of the specimens offered for prizes the past season have possessed points of superior excellence. In a few instances, as may be seen by reference to the list of awards, they have fallen so far below the standard that the prizes have been wholly withheld; sometimes the first has been withheld and the second or third awarded; that course being followed which in the judgment of the Committee was best adapted to each particular case. This we are aware is exceedingly unpopular with some exhibitors, who claim that an exhibitor is entitled to a first premium on the mere ground that he is the only one competing, although his specimens may be very inferior. The Committee believe that the stricter practice should be persistently followed, as thus only can the standard of excellence be maintained, and poor and inferior specimens be excluded from our exhibitions.

The weekly exhibitions have, we think, been in advance of those of last year. Competition has been unusually active, and the exhibits, both as to quality and variety, have been among the best, though by no means so large as we hope to see the coming season.

Peas have been shown in more than the usual quantity. Among the earlier varieties, the American Wonder still takes the lead, and at the Rose and Strawberry Show was awarded the first prize over all competitors. Of the varieties of recent introduction, Carter's Stratagem, Sharp's Early Paragon, and Invincible, seem the most deserving of notice. The Stratagem is a new green wrinkled pea of great merit, and probably the handsomest and most productive of its class. The vines grow about two feet in height, and are covered with immense pods, filled with peas of the largest size, of the finest quality for the table. This variety was shown by the Chairman, July 11, and has invariably taken the first prize during the season, whenever it has been put in competition. The Paragon and Invincible were shown by C. H. Hovey & Co. Both were very attractive and both were awarded prizes, — the Paragon receiving a first prize, and the Invincible a second.

Tomatoes, as in seasons past, have been a very prominent feature at our exhibitions. The first prize day was July 18; but the specimens offered were not considered worthy of the first prize, and it was consequently withheld. July 25, however, and also at subsequent exhibitions, the specimens shown were remarkably fine, and formed a very interesting and attractive portion of the display. Great improvement has been made in this popular vegetable within the past ten or twelve years, in regard to form, texture, and quality; yet little advance, if any, has been made in earliness. Year after year new varieties have been introduced, which in almost every instance were claimed by the originator to be from one to two weeks earlier than their predecessors. Experience proves, however, that if the word *minutes* had been substituted in the place of "weeks," it would in a large majority of cases have come much nearer the truth. At the Annual Exhibition the display of tomatoes was not as large as that of last year, there being but forty-one dishes on exhibition, against eighty on the previous occasion. This was owing mainly to the fact that one, who in years past has been amongst the largest contributors, this year failed to put in an appearance.

At the October and Chrysanthemum shows the displays of vegetables were the largest and best we have ever made at this season of the year.

The past season has been favorable for the growth and development of the Cauliflower; the specimens which have been shown have never been surpassed, if equalled, and reflected the greatest credit upon all the contributors. The first prizes on September 5 and October 3, and the Special and first Regular prizes at the Annual Exhibition, were all awarded to P. G. Hanson. October 10, some very fine specimens were shown by W. P. Walker, the largest of which turned the scales at thirteen pounds. At the Chrysanthemum Show, the first prize for cauliflowers was won by Mrs. Mary T. Goddard, who capped the climax with a splendid specimen weighing fifteen and three-quarters pounds.

The remarks regarding the cauliflower apply equally well to Celery, which was exhibited in great perfection, not only at the Annual Exhibition, but also at the October and November shows. The Special prize at the Annual was awarded to Warren Heustis for Henderson's Half Early Dwarf. The regular prize was taken by Josiah Crosby for Boston Market. The last named competitor also received the first prize at the October show for the same

variety. At the Chrysanthemum show the first prize for celery was won by George Hill, with the Arlington. So numerous and so excellent, and in some cases so closely matched in size, beauty, and quality, have been the specimens exhibited in competition for the prizes, that more than once the Committee have been somewhat embarrassed in deciding on the awards. They have, however, strenuously endeavored in all cases to do the most exact justice to the different competitors; and if they have failed in this respect it has been through error of judgment.

One of the leading attractions at the Annual Exhibition was a new Seedling Potato, grown and exhibited by Albert Bresee of Hubbardton, Vermont, the originator of the Early Rose and other valuable varieties. This was the first time he has ever shown it, and it has not yet been named. There were fifty-two dishes of potatoes on exhibition, but this seedling of Mr. Bresee exceeded them all in beauty and general appearance, and was much admired. The Committee, with others,— among them Hon. Marshall P. Wilder,— had an opportunity of testing its quality, and Mr. Wilder's verdict was, "good enough":— in which all the members of the Committee coincide. As an example of the interest manifested by the visiting public with regard to this new seedling, and to show the confidence with which its value was inferred from its appearance, it may be of interest to state that an offer of fifty dollars was made to Mr. Bresee (in the presence of the Chairman), for the twelve specimens on exhibition, which was increased to one hundred dollars after a test of their quality. The offer was not accepted. This variety will be on exhibition again next season, when a more extended report will be in order, if upon further trial it shall be found up to the standard which its originator expects it to reach. Mr. Bresee will enter it for the Prospective Prize, if it fills the bill.

The annexed list shows the amount awarded in prizes and gratuities for the past season to be $750, leaving an unexpended balance of $80.

All of which is respectfully submitted.

For the Committee,

C. N. BRACKETT, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

JANUARY 3.

RADISHES.— Four bunches, George Hill,	$3 00
Second, George F. Stone,	2 00
CUCUMBERS.— Pair, C. H. Brackett, Brighton,	3 00
Second, C. H. Brackett, White Spine,	2 00
LETTUCE.— Four heads of Tennisball, G. F. Stone,	3 00
Second, W. W. Rawson,	2 00
Third, George Hill,	1 00
MUSHROOMS.— Twenty-four specimens, C. H. Brackett,	3 00

Gratuities:—

George W. Pierce, Brussels Sprouts,	2 00
George F. Stone, Parsley,	1 00

JANUARY 17.

Gratuity:—

C. H. Brackett, Cucumbers and Mushrooms,	2 00

JANUARY 24.

Gratuity:—

C. H. Brackett, White Spine and Brighton Cucumbers, and Mushrooms,	2 00

JANUARY 31.

Gratuity:—

George Hill, Dandelions and Lettuce,	2 00

FEBRUARY 7.

RADISHES.— Four bunches, George F. Stone,	3 00
CUCUMBERS.— Pair of any variety, C. H. Brackett, Brighton,	3 00
Second, C. H. Brackett, White Spine,	2 00
LETTUCE.— Four heads of Tennisball, George F. Stone,	3 00
Second, George Hill,	2 00
Third, W. D. Philbrick,	1 00
MUSHROOMS.— Twenty-four specimens, C. H. Brackett,	3 00

Gratuities: —

George F. Stone, Dandelions and Parsley,	$2 00
George Hill, " " "	1 00
Mrs. Francis B. Hayes, Asparagus,	2 00
W. D. Philbrick, Parsley,	1 00

FEBRUARY 14.

Gratuities:—

Mrs. Francis B. Hayes, Rhubarb and Asparagus,	2 00
Isaac E. Coburn, "	1 00

FEBRUARY 21.

Gratuities: —

Orlando F. Newhall, Tomatoes, Radishes, Mushrooms, Asparagus, and Rhubarb,	4 00
Mrs. Francis B. Hayes, Rhubarb,	1 00
C. H. Brackett, Mushrooms,	1 00

FEBRUARY 28.

Gratuities:—

George F. Stone, Lettuce,	2 00
Josiah Crosby, "	1 00
C. H. Brackett, Mushrooms and Cucumbers,	2 00
C. M. Hovey, "	1 00
Mrs. Francis B. Hayes, Seedling Rhubarb,	1 00

MARCH 7.

Gratuities: —

Josiah Crosby, Dandelions, Radishes, and Lettuce,	2 00
C. H. Brackett, Mushrooms, and two varieties of Cucumbers,	2 00
Warren Heustis, Celery and Radishes,	1 00

MARCH 14.

Gratuities: —

C. H. Brackett, Cucumbers and Mushrooms,	2 00
George F. Stone, Radishes,	1 00

SPRING EXHIBITION.

MARCH 19 AND 20.

RADISHES.— Four bunches of Turnip Rooted, Josiah Crosby,	$3 00
Second, W. D. Philbrick,	2 00
Third, George F. Stone,	1 00
CUCUMBERS.— Pair, C. H. Brackett, White Spine,	3 00

DANDELIONS.— Peck, Josiah Crosby,	$2 00
Second, George F. Stone,	1 00
LETTUCE.— Four heads of Tennisball, George F. Stone,	3 00
Second, Josiah Crosby,	2 00
Third, W. D. Philbrick,	1 00
PARSLEY.— Two quarts, George F. Stone,	2 00
Second, Mrs. E. M. Gill,	1 00
TOMATOES.— Twelve specimens, Charles Winter,	3 00
Second, W. C. Winter,	2 00
Third, Winter Brothers,	1 00

Gratuities :—

C. H. Brackett, Mushrooms and Cucumbers,	2 00
O. F. Newhall, "	1 00
C. H. Hovey & Co., " and Tomatoes,	1 00
E. Saunders, Rhubarb,	1 00

MARCH 28.

Gratuity :—

C. H. Brackett, Rhubarb, Cucumbers, and Mushrooms,	2 00

APRIL 11.

Gratuity : —

Josiah Crosby, Lettuce and Dandelions,	2 00

APRIL 18.

Gratuity : —

C. H. Brackett, Cucumbers, Rhubarb, Tomatoes, Asparagus, and Mushrooms,	4 00

APRIL 25.

Gratuity : —

C. H. Brackett, Rhubarb, Tomatoes, two varieties of Cucumbers, Asparagus, and Mushrooms,	3 00

MAY 2.

Gratuity : —

Warren Heustis, Radishes.	1 00

MAY 9.

CUCUMBERS.— Pair, C. H. Brackett, Brighton,	2 00
Second, C. H. Brackett, Telegraph,	1 00
SPINACH.— Peck, Josiah Crosby,	3 00
LETTUCE.— Four heads, George F. Stone,	2 00
Second, Josiah Crosby,	1 00
RHUBARB.— Twelve stalks, C. H. Brackett, Victoria,	2 00

Gratuities:—

Josiah Crosby, Beets, Carrots, and Dandelions,	$3 00
C. H. Brackett, Collection,	2 00
Warren Heustis, "	2 00

MAY 16.

Gratuities:—

E. Sheppard, Cucumbers,	1 00
M. W. Chadbourne, Asparagus,	1 00

MAY 23.

Gratuities:—

John B. Moore & Son, Asparagus,	1 00
L. W. Weston, "	1 00
Samuel Hartwell, "	1 00
W. K. Wood, Rhubarb,	1 00

JUNE 6.

RADISHES.— Four bunches of Long Scarlet, Josiah Crosby,	2 00
ASPARAGUS.— Four bunches, John B. Moore & Son,	2 00
Second, L. W. Weston,	1 00
CUCUMBERS.— Pair, E. Sheppard, Telegraph,	2 00
Second, C. H. Brackett, Brighton,	1 00
LETTUCE.— Four heads, George F. Stone,	2 00
MUSHROOMS.— Twenty-four, C. H. Brackett,	2 00
RHUBARB.— Twelve stalks, C. H. Brackett, Victoria, 22 lbs.,	2 00
Second, John B. Moore & Son, Monarch, 16 lbs. 15 oz.,	1 00

Gratuities:—

George F. Stone, Spinach,	1 00
C. H. Brackett, Tomatoes,	1 00

JUNE 13.

Gratuity:—

Samuel Hartwell, Asparagus,	1 00

JUNE 20.

Gratuity:—

E. Sheppard, Cucumbers,	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 25 AND 26.

Whitcomb Prizes.

BEETS.— Twelve Turnip Rooted, George D. Moore,	$2 00
Egyptian, Josiah Crosby,	2 00

ONIONS.— Twelve, Josiah Crosby,	$2 00
Second, George D. Moore,	1 00
CUCUMBERS.— White Spine, Warren Heustis,	2 00
Second, George F. Stone,	1 00
CABBAGES.— Four, George D. Moore,	2 00
LETTUCE.— Four heads, George F. Stone,	2 00
Second, George D. Moore,	1 00
PEAS.— Half-peck, C. N. Brackett, American Wonder,	3 00
Second, S. Hartwell, Advancer,	2 00
Third, George F. Stone, Dan O'Rourke,	1 00

Gratuities :—

Charles Winter, Tomatoes,	1 00
Samuel Hartwell, Asparagus,	1 00
E. Sheppard, Cucumbers,	1 00
John B. Moore & Son, Rhubarb,	1 00

JULY 4.

ONIONS.— Twelve, Josiah Crosby,	2 00
Second, George D. Moore,	1 00
SQUASHES.— Four Long Warted, Warren Heustis,	2 00
CABBAGES.— Four, George D. Moore,	3 00
Second, Warren Heustis,	2 00
PEAS.— Half-peck, C. H. Hovey & Co., Sharp's Early Paragon,	3 00
Second, C. E. Grant, Advancer,	2 00

JULY 11.

POTATOES.— Twelve specimens, C. D. Kingman, Chicago Market,	3 00
Second, C. D. Kingman, Savoy,	2 00
Third, Samuel Hartwell, Early Sunrise,	1 00
SQUASHES.— Four Long Warted, J. Crosby,	2 00
BEANS.— Half-peck of String, S. Hartwell,	2 00
Second, S. Hartwell,	1 00
PEAS.— Half-peck, C. N. Brackett, Stratagem,	3 00
Second, George F. Stone, Advancer,	2 00
Third, C. H. Hovey & Co., Invincible,	1 00

Gratuities :—

George D. Moore, Beets,	1 00
George F. Stone, Lettuce and Cucumbers,	1 00

JULY 18.

CABBAGES.— Four Drumhead, George D. Moore,	3 00
Second, Warren Heustis,	2 00

PEAS.— Half-peck, C. N. Brackett, Stratagem,	$3 00
Second, C. H. Hovey & Co., Invincible,	2 00
Third, C. N. Brackett, American Wonder,	1 00
TOMATOES.— Twelve, the second prize to George D. Moore,	2 00

Gratuity: —

S. Hartwell, Potatoes,	1 00

JULY 25.

POTATOES.— Twelve, L. W. Weston, Hebron,	3 00
Second, S. Hartwell, Sunrise,	2 00
Third, L. W. Weston, "	1 00
SQUASHES.— Four Marrow, Josiah Crosby,	3 00
SWEET CORN.— Twelve ears, C. N. Brackett, Marblehead,	3 00
Second, Samuel Hartwell, "	2 00
Third, George F. Stone, "	1 00
TOMATOES.— Twelve, C. N. Brackett, Acme,	3 00
Second, George Hill, Emery,	2 00

Gratuities: —

C. N. Brackett, Collection,	2 00
Josiah Crosby, Onions,	1 00

AUGUST 1.

SQUASHES.— Four Marrow, Josiah Crosby,	2 00
PEAS.— Half-peck, C. N. Brackett, Stratagem,	3 00
Second, Warren Heustis, Advancer,	2 00
Third, C. N. Brackett, Yorkshire Hero,	1 00
SWEET CORN.— Twelve ears, Josiah Crosby, Crosby,	2 00
Second, Warren Heustis, "	1 00
TOMATOES.— Twelve, George Hill, Boston Market,	3 00
Second, C. N. Brackett, Acme,	2 00
Third, George Hill, Emery,	1 00

Gratuities:—

George Hill, Greenflesh Melons,	3 00
Mrs. E. M. Gill, Wax Beans,	1 00
Samuel Hartwell, Sunrise Potatoes,	1 00
C. N. Brackett, Collection,	2 00

AUGUST 7.

GREENFLESH MELONS.— Four, George Hill,	3 00
BEANS.— Half-peck of Horticultural, S. Hartwell,	3 00

TOMATOES.— Acme, C. N. Brackett,	$3 00
Emery, George Hill,	3 00
Second, Samuel Hartwell,	2 00
Third, C. N. Brackett,	1 00
Any other variety, George Hill, Boston Market,	3 00
Second, Samuel Hartwell, Perfection,	2 00
Gratuities:—	
Samuel Hartwell, Lima Beans,	2 00
C. E. Grant, Beans,	1 00
Warren Heustis, Corn and Peas,	2 00
C. N. Brackett, Bliss's Abundance Peas, and Tomatoes,	2 00
Cephas H. Brackett, Mushrooms,	1 00

AUGUST 15.

GREENFLESH MELONS.— Four, W. W. Rawson,	3 00
SALMON FLESH MELONS.— Four, Warren Heustis,	3 00
Second, Warren Heustis,	2 00
EGG PLANTS.— Four Round Purple, J. G. Coolidge,	2 00
Second, George D. Moore,	1 00
Gratuities:—	
George D. Moore, Parsnips,	1 00
C. H. Brackett, Mushrooms,	1 00
C. E. Grant, Tomatoes,	1 00
M. W. Chadbourne, Corn,	1 00
Samuel Hartwell, Collection,	3 00
C. N. Brackett, "	2 00
Mrs. William Houseman, Collection,	1 00

AUGUST 22.

POTATOES.— Twelve, S. Hartwell, Savoy,	3 00
Second, L. W. Weston, Hebron,	2 00
Third, C. N. Brackett, Savoy,	1 00
BEANS.—Two quarts of Lima, B. G. Smith,	3 00
Second, Samuel Hartwell,	2 00
PEPPERS.— Twelve, C. N. Brackett,	3 00
Gratuities:—	
W. Heustis, Melons and Corn,	2 00
C. E. Grant, Tomatoes,	1 00
C. H. Brackett, Mushrooms,	1 00
M. W. Chadbourne, Okra,	1 00
Samuel Hartwell, Collection,	3 00

AUGUST 29.

WATERMELONS.— Pair, Samuel Hartwell,	3 00
GREENFLESH MELONS.— Four, Samuel Hartwell,	3 00

Gratuities:—

Warren Heustis, Melons,	$2 00
Josiah Crosby, Celery and Carrots,	2 00
C. E. Grant, Corn and Tomatoes,	1 00
Samuel Hartwell, Collection,	2 00
C. N. Brackett, "	2 00

SEPTEMBER 5.

CAULIFLOWERS.—Four, P. G. Hanson,	3 00
CELERY.—Four roots, George D. Moore,	3 00
Second, Josiah Crosby,	2 00
LIMA BEANS—Two quarts, B. G. Smith,	3 00
Second, Samuel Hartwell,	2 00

Gratuities:—

P. G. Hanson, Turnips and Beets,	2 00
Warren Heustis, Melons,	2 00
C. E. Grant, Corn and Tomatoes,	1 00
Mrs. W. Houseman, Beans, and Kohl Rabi,	1 00
Samuel Hartwell, Collection,	4 00
C. N. Brackett, "	3 00

ANNUAL EXHIBITION.

SEPTEMBER 15, 16, 17 AND 18.

Special Prizes.

CAULIFLOWERS.—Best four, and best kept during the exhibition, P. G. Hanson,	$5 00
CELERY.—Best four roots, and best kept during the exhibition, Warren Heustis,	5 00

Regular Prizes.

BEETS.—Twelve Turnip Rooted, Walter Russell,	3 00
Second, George F. Stone,	2 00
Third, George D. Moore,	1 00
CARROTS.—Twelve Long Orange, W. W. Rawson,	3 00
Second, John L. D'Wolf,	2 00
Twelve Intermediate, Josiah Crosby,	3 00
Second, W. W. Rawson,	2 00
Third, Walter Russell,	1 00
PARSNIPS.—Twelve Long, W. W. Rawson,	3 00
Second, John L. D'Wolf,	2 00
Third, George D. Moore,	1 00

POTATOES.— Four varieties, twelve specimens each, Mrs. M. T. Goddard,	$5 00
Second, C. N. Brackett,	4 00
Third, Samuel Hartwell,	3 00
Clark, Mrs. M. T. Goddard,	3 00
Second, H. B. Watts,	2 00
Third, C. B. Lancaster,	1 00
Hebron, L. W. Weston,	3 00
Second, George W. Pierce,	2 00
Third, Mrs. M. T. Goddard,	1 00
Rose, Mrs. M. T. Goddard,	3 00
Second, George W. Pierce,	2 00
Any other variety, George W. Pierce, Savoy,	3 00
Second, S. A. Merrill, Savoy,	2 00
Third, Samuel Hartwell, "	1 00
SALSIFY.— Twelve roots, Charles F. Curtis,	3 00
Second, Walter Russell,	2 00
Third, John L. D'Wolf,	1 00
TURNIPS.— Twelve Flat, P. G. Hanson,	3 00
Swedish, P. G. Hanson,	3 00
Second, Mrs. M. T. Goddard,	2 00
ONIONS.— Twelve Danvers, George Hill,	3 00
Second, George D. Moore,	2 00
Third, Walter Russell,	1 00
Portugal, Josiah Crosby,	3 00
Second, Walter Russell,	2 00
Red, Walter Russell,	3 00
GREENFLESH MELONS.— Four, Samuel Hartwell,	3 00
Second, William Richardson,	2 00
Third, Charles F. Curtis,	1 00
WATERMELONS.— Two, Samuel Hartwell,	3 00
Second, Benjamin G. Smith,	2 00
Third, Walter Russell,	1 00
SQUASHES.— Four Canada, Josiah Pratt,	3 00
Second, C. B. Lancaster,	2 00
Third, C. N. Brackett,	1 00
Hubbard, P. G. Hanson,	3 00
Second, George Hill,	2 00
Third, W. W. Rawson,	1 00
Marblehead, P. G. Hanson,	3 00
Marrow, W. W. Rawson,	3 00
Second, George Hill,	2 00
Third, P. G. Hanson,	1 00
Turban, P. G. Hanson,	3 00
Second, W. W. Rawson,	2 00
CABBAGES.— Three Drumhead, C. B. Lancaster,	3 00
Second, P. G. Hanson,	2 00

Red, P. G. Hanson,	$3 00
Savoy, C. B. Lancaster,	3 00
Second, P. G. Hanson,	2 00
CAULIFLOWERS.—Four, P. G. Hanson,	3 00
Second, W. W. Rawson,	2 00
Third, W. H. Teel,	1 00
CELERY.—Four roots, Josiah Crosby,	3 00
Second, W. W. Rawson,	2 00
Third, Warren Heustis,	1 00
ENDIVE.—Four specimens, George W. Pierce,	2 00
HORSERADISH.—Six roots, W. W. Rawson,	3 00
Second, George D. Moore,	2 00
Third, Walter Russell,	1 00
BEANS.—Two quarts Lima, Benjamin G. Smith,	3 00
Second, Samuel Hartwell,	2 00
Third, S. A. Merrill,	1 00
CORN.—Twelve ears of Sweet, S. A. Merrill, Stowell's,	3 00
Second, J. J. H. Gregory, Mammoth,	2 00
Third, C. N. Brackett, Potter's Excelsior,	1 00
Yellow or Field, Twenty-five ears, traced, Mrs. M. T. Goddard,	3 00
Second, Horace Eaton,	2 00
EGG PLANTS.—Four Round Purple, George D. Moore,	3 00
Second, J. G. Coolidge,	2 00
Third, George Hill,	1 00
TOMATOES.—Three varieties, twelve specimens each, C. N. Brackett,	5 00
Second, Samuel Hartwell,	4 00
Third, J. J. H. Gregory,	3 00
Acme, C. N. Brackett,	3 00
Second, C. E. Grant,	2 00
Third, Samuel Hartwell,	1 00
Emery, Solomon Shute,	3 00
Second, C. N. Brackett,	2 00
Third, J. J. H. Gregory,	1 00
Paragon, George F. Stone,	3 00
Perfection, C. N. Brackett,	3 00
Second, P. G. Hanson,	2 00
Third, Solomon Shute,	1 00
Any other variety, C. N. Brackett, Cardinal,	3 00
Second, George Hill, Boston Market,	2 00
Third, Stillman S. Hovey, Favorite,	1 00
MARTYNIAS.—Twenty-four, M. W. Chadbourne,	2 00
PEPPERS.—Twenty-four, C. N. Brackett,	3 00
Second, George F. Stone,	2 00
Third, Josiah Crosby,	1 00

Gratuities: —

Albert Bresee, New Seedling Potato,	$3 00
J. J. H. Gregory, Potatoes,	2 00
Joseph G. Coolidge, Greenflesh Melons,	2 00
Warren Heustis, Salmon Flesh Melons,	2 00
George W. Pierce, Bay View Melons,	2 00
P. G. Hanson, Collection of Watermelons,	4 00
P. G. Hanson, Turban Squashes,	1 00
S. A. Merrill, Squash,	1 00
C. H. Hovey & Co., Collection of Squashes,	3 00
C. N. Brackett, Goddard Beans,	1 00
Cephas H. Brackett, Cucumbers and Mushrooms,	2 00
J. J. H. Gregory, Collection,	5 00
Walter Russell, "	3 00
M. W. Chadbourne, "	2 00
Miss Addie Tornberg, "	1 00

SEPTEMBER 26.

Gratuity: —

C. N. Brackett, Tomatoes,	1 00

OCTOBER 3.

SQUASHES. — Four Hubbard, P. G. Hanson,	3 00
Second, Samuel Hartwell,	2 00
Third, Mrs. M. T. Goddard,	1 00
Marrow, the second prize to M. W. Chadbourne,	2 00
BRUSSELS SPROUTS. — Half-peck, Mrs. M. T. Goddard,	3 00
Second, Edgar P. Bliss,	2 00
CABBAGES. — Three Drumhead, C. B. Lancaster,	3 00
Second, P. G. Hanson,	2 00
Third, C. N. Brackett,	1 00
Red, P. G. Hanson,	3 00
Second, C. N. Brackett,	2 00
Savoy, P. G. Hanson,	3 00
Second, C. N. Brackett,	2 00
Third, C. B. Lancaster,	1 00
CAULIFLOWERS. — Four, P. G. Hanson,	3 00
Second, Mrs. M. T. Goddard,	2 00
Third, C. B. Lancaster,	1 00
CELERY. — Four roots, Josiah Crosby,	4 00
Second, George F. Stone,	3 00

Gratuities: —

Cephas H. Brackett, Mushrooms,	1 00
C. E. Grant, Tomatoes,	1 00
George F. Stone, Radishes and Lettuce,	1 00

Benjamin G. Smith, Lima Beans,	$1 00
M. W. Chadbourne, Melons and Squashes,	1 00
C. N. Brackett, Collection,	3 00
Samuel Hartwell, "	3 00
Edgar J. Bliss, "	1 00

OCTOBER 10.

Gratuity:—

W. P. Walker, Cauliflower (weight of largest specimen, 13 lbs.),	2 00

CHRYSANTHEMUM SHOW.

NOVEMBER 12 AND 13.

CAULIFLOWERS.— Mrs. M. T. Goddard,	$3 00
Second, P. G. Hanson,	2 00
BRUSSELS SPROUTS.— Half-peck, G. W. Pierce,	3 00
Second, Mrs. M. T. Goddard,	2 00
CELERY.— Four roots, George Hill, Arlington,	3 00
Second, Warren Heustis, Henderson's Dwarf,	2 00
Third, George Hill, Boston Market,	1 00

Gratuities:—

L. W. Weston, Hebron Potatoes,	1 00
A. S. McIntosh, Artichokes,	1 00
C. H. Brackett, Cucumbers,	1 00
Mrs. M. T. Goddard, Cauliflower (weighing 15¾ lbs.),	1 00
Edgar J. Bliss, Brussels Sprouts,	1 00
C. E. Grant, Celery,	1 00
George F. Stone, White Plume Celery,	1 00
George W. Pierce, Endive,	1 00
Winn, Ricker & Co., Tomatoes,	1 00
Samuel Hartwell, Collection,	2 00

DECEMBER 5.

Gratuities:—

W. W. Rawson, Lettuce,	1 00
C. H. Brackett, Mushrooms,	1 00

DECEMBER 12.

Gratuity:—

Edgar J. Bliss, Brussels Sprouts,	1 00

DECEMBER 26.

Gratuity:—

George Hill, Lettuce,	1 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1885.

By JOHN G. BARKER, Chairman.

In bringing before you the report of this Committee for the year now closing, we do so with a degree of satisfaction that the object sought in the formation of the Committee has been more adequately attained in this than in some recent years. In looking over the History of the Society we see that in some former years they were more frequently called upon than of late; and at times it appeared as though all the gardens of any note in this vicinity had been visited. We cannot avoid a feeling of regret that opportunities are not even more frequently presented for the performance of the duties of this Committee. With the increase in the number of gardens and the general advance of horticulture, in this special line we are hardly keeping pace with the times. There was no application for the prize for the Amateur Conservatory, or the Collection of Hardy Biennial and Perennial Herbaceous Plants: and for the Peach Orchard, of course none was expected.

The Middlesex Fells.

The first visit of the season was made July 13th, when by invitation of the Hon. Elizur Wright, your Committee viewed the Middlesex Fells. It is doubtless well known to you all that Mr. Wright has taken a very deep interest in this project from its earliest inception, and has done all that lay in his power to make it successful. With a desire that a more extended knowledge of the Fells should be diffused, especially among the members of

this Society, your Committee, with other gentlemen, spent a very delightful day in inspecting under his guidance the territory comprising the Fells. We regret that we have not his own account of the inception and growth of this project, which he had promised us; but the labors of our friend have ended. We shall append a few statistics and facts such as are now at our command, and will bring to your notice as briefly as possible the object of his desire and exertions.

At a public meeting held in 1881 in the town of Medford, in the interest of this project, a letter was read from Mr. John Botume, in which he said: "The territory contains within itself all the requirements of a magnificent natural park — fine old pines and hemlocks, many varieties of oak, walnut, birch, and elm trees; superb water views, not only of inland lakes and ponds but of the ocean, and winding roads and paths among trees through whose interlaced branches the summer sun hardly penetrates. It appears to me that its manifest destiny is to be also the most useful compared with any tract of its size. The distance from the Boston Post Office to its centre is six miles, the same distance that the people of Chicago have to travel to reach their great West Side Park. Her park is artistically beautiful, but it is not nature, and she would give millions for such opportunities as you have before you." Mr. Wright said "that the proposition was to subscribe money enough to buy the property at its assessed value, and then ask the State to take it by right of eminent domain. The territory would be put under the charge of competent men, and in fifty years under proper cultivation and management would produce forty thousand dollars worth of timber annually, which would be for the benefit of the State. All the rocks and hills could be covered with pine in a hundred years." He did not believe a single proprietor of the one hundred and thirty who own the Fells would object to the plan proposed.

Perhaps this outline of the project is enough to bring before you at this time. Nature has done much; art may help; judiciously laid out paths and roadways from the main roads to the prominent points could not fail of making this one of the finest natural parks not only in this Commonwealth, but in this country.

In these days of Forestry Congresses as well as magnificent parks and gardens, on the latter of which so much money is being uselessly spent, can this Society do better than to encourage the

formation of Societies such as the Free Public Forest Association in Lynn, which has been the means of preserving from devastation and destruction many naturally beautiful places, which by a very small expenditure can be made easily accessible, and can be enjoyed by thousands of our people fully as much as the park and boulevard? Let us, as the leading Horticultural Society of America, do all we can to encourage village improvement societies, and in every possible way promote the disposition to improve our suburban towns, villages, and gardens; let our influence be felt more than ever outside the walls of this building, and let us wake up fully to the high privileges and duties that belong to us as members of one of the noblest educational institutions in this country.

Garden of Mrs. Mary E. Goddard.

August 19th, the Committee, upon invitation of Mrs. Mary E. Goddard, went to Hopedale to visit her garden; and take great pleasure in making their report of this visit.

The ground comprises about twenty-five thousand feet, and is devoted largely to a lawn with flower beds cut in the grass.

Perhaps the most noticeable bed was the one on the right of the walk, near the entrance. It was twenty-eight feet in length by four and a half feet in width, and planted in three sections with *Phlox Drummondi,— Isabellina* occupying the centre, with *coccinea* and *rosea* at the ends. Lengthwise in the centre of the *Phlox Drummondi rosea* were Blue Victoria Asters; and similarly in the *coccinea*, White Asters, and in the *Isabellina*, Red Asters. A border of Ageratum Tom Thumb surrounded the whole; the stiff woody growth of the Ageratum serving to hold the Phlox upright. By this means all the plants were kept in place without any aid of stakes or twine. The colors of the flowers blended harmoniously, and the whole effect of this arrangement, using but a few varieties judiciously placed, was very pleasing, and fully proved that it does not require a large expenditure of money to have a nice bed of flowers tastefully arranged.

Another bed next the wall, sixty feet long and three and a half feet wide was planted with Single Dahlias, *Salvia splendens*, and Zinnias; with a row of Gaillardia in front, and Tropeolum Spitfire running over the stone wall.

In front of the house a circular bed was arranged with Cannas

in the centre, surrounded by a row of *Coleus Verschaffeltii*, and outside of that a row of *Centaurea gymnocarpa*.

On the east side of the house a crescent shaped bed contained three varieties of Coleus, each color being planted separately.

In another bed we noticed *Tritoma Uvaria* with *Canna Ehemanni* in the centre, bordered with Portulacca; in the spring this bed contained Pansies.

The piazza was covered with neatly trained vines of *Tropæolum Lobbianum*, *Cobœa scandens*, and Thunbergias.

Mrs. Goddard says: "I sow my seeds in April in very gentle heat, and ought to transplant once before putting into the garden, but for lack of room omit to do so except with a few plants of Pyrethrum. I have the flower beds dug very deep and made quite rich, and then a top dressing of phosphate is dug in around each plant, and the earth is loosened at least once a week, until the plants are so large that it is impossible to do so."

Considering that Mrs. Goddard has only a few hot-beds and a bay window in which to raise the plants that filled these beds, we think that no one need despair of having a pleasant and attractive flower garden. Since bedding plants can be obtained at a very low figure, there has been a tendency of late to undervalue annuals; but here we certainly have a very pleasing example of their effective use. We are informed that, aside from the small sum paid for seeds and ten dollars for extra labor, all the work was done by members of the household; and we take pleasure in reporting this flower garden as the most neatly kept, most tastefully arranged, and economically managed of the kind that we have been called upon to visit. The Committee unanimously award Mrs. Goddard the premium of $20 for the best arranged and best kept flower garden.

Vineyards.

As you are all well aware the planting of Vineyards and the growing of grapes for the million have of late years received a good deal of attention, and much land before unproductive, or yielding but small returns from the usual farm crops, has been devoted to the culture of grapes, with satisfactory returns. But in this uncertain climate it is still a question with a great many what variety to plant that will ripen best and market most easily. We find upon inquiry a general complaint that much unripe fruit has

been put upon the market the past season — perhaps tolerably well colored, but still not quite ripe. Indeed, many of the wholesale dealers will answer the question "Who sends you the ripest and best grapes?" without even stopping to think a single moment,—"Why Mr. A's or Mr. B's are always number one, but while Mr. C's are nice fruit, they did not hang on the vine long enough, and are not quite ripe." In view of these facts we have been asked the question more than once, "What varieties of grapes shall I plant in my garden?" In order to meet the requirement of one of the members of the Society, who said to the Chairman of the Garden Committee, "I have no fault to find, but I want to be told not only that you were pleased with this one's place, and that one's skill, but how they did it, and what you would recommend I should do,"— we will answer the one direct question, "What four or five grapes can I plant in my garden with a reasonable surety in ordinary seasons of having the fruit ripen?" As far as our observation and experience go, and after conference with the Chairman of the Fruit Committee, we recommend to the amateur, for this climate, the Moore's Early and Hayes for early; next the Worden, and later the Concord and Niagara.

Vineyard of Jonas P. Hayward.

The past season your Committee received invitations from Jonas P. Hayward of Ashby, and Samuel Hartwell of Lincoln, to inspect their vineyards. Mr. Hayward entered two vineyards; which your Committee visited twice, the first visit being early in September. We found both vineyards in the highest and best possible state of cultivation, and the fine clean handsome foliage and good growth of wood such as is seldom excelled, while the crop of fruit was certainly one of the evenest it has been our fortune to see; indeed both vineyards, especially No. 1, afforded evidence that Mr. Hayward had given thought and time to bring about the best possible results. He makes the Concord the main crop, and prefers Thanksgiving time to any earlier date for marketing his grapes. At our second visit, on the 6th of October, the crop was ripe, and it was our privilege to taste as well as look. Several other gentlemen accompanied the Committee at this time, all practical growers, and we do not hesitate to pronounce vineyard No. 1 to be one of the best vineyards of Concord grapes we have

ever inspected. To this vineyard your Committee have unanimously awarded the First Prize of $30.

Vineyard No. 2, being on a sidehill, had washed somewhat, but the general remarks made upon the first mentioned apply equally to this. Here we found the Niagara, and we are sure that we only express the opinion of all present, when we say that its condition exceeded our expectations; and those who had doubts in regard to its ripening qualities are now quite ready to give it a place with the Concord as a very desirable late grape. The following statement by Mr. Hayward will be read with interest by all:

To the Garden Committee of the Massachusetts Horticultural Society:—

My vineyard No. 1 contains twelve hundred vines, all Concords, except one row containing a considerable number of varieties. It was planted in 1877, in light gravelly loam, the vines being set six feet apart in rows eight feet apart. The vines are trained on a four-wire trellis, fruiting two arms of six feet each on each vine, at the same time growing two canes for renewal.

When the shoots are about eighteen inches long they are cut back to six leaves; also cutting all tendrils and all but two of the growing fruit buds. All laterals are cut back to one leaf, which has to be done two or three times each season, according to the vigor of the plant. When the grapes are about the size of peas, the clusters are straightened, counted, and cut down to thirty or less. My aim is to raise ten pounds to the vine.

The renewal canes I have sometimes kept cut back to six feet during the summer; but for the past two years I have let them grow as far as they would, which has been from eight to twelve feet, and then at the fall pruning cut back to six feet. I do not know which is the better way.

I have tried to raise grapes without fertilizing, but of late years have applied chemicals to the value of about one cent per vine. This year I have doubled it. On this vineyard I have applied this year—

100 lbs. Sulphate of Ammonia,
325 " Muriate of Potash,
400 " Dissolved Bone-black,
75 " Sulphate of Magnesia,
300 " South Carolina Rock Phosphate.

This was thoroughly mixed and evenly sown broadcast. Then, for an experiment, I sowed one bag of Stockbridge Fertilizer for Grapes on one-half the vineyard. The difference is hardly noticeable.

The reason for increasing the amount of fertilizer was that the foliage had not always been quite satisfactory; but this year it is all I could desire. I keep the ground free from weeds, and cultivate thoroughly with an Acme harrow.

Vineyard No. 2 contains two thousand vines, a part of which is the oldest vineyard but one in town. Five hundred and fifty vines were planted in 1867; others were added in 1871 and 1872. These are all Concords. In 1881 I added three hundred Niagaras.

My treatment of this vineyard has been the same as that of No. 1, with the exception that, being on a sidehill and apt to wash, it seems to require a larger supply of fertilizer. This year I have applied as follows:

672	lbs.	Muriate of Potash,
1,000	"	Dissolved Bone-black,
125	"	Sulphate of Magnesia,
150	"	Sulphate of Ammonia,
690	"	South Carolina Rock Phosphate,

and one bag of Stockbridge Fertilizer, with the same result as on vineyard No. 1.

J. P. HAYWARD.

Vineyard of Samuel Hartwell.

September 8th the Committee visited Samuel Hartwell's vineyard at Lincoln, and found Moore's Early the variety made the specialty in this case. Mr. Hartwell, unlike Mr. Hayward, wanted an early grape, his theory being that it can be marketed quickly and got out of the way without handling more than once. The Committee made a careful inspection of the vineyard and were pleased with the mode of training and general cultivation, and are quite prepared to again recommend the Moore's Early as the best hardy grape for general cultivation. They unanimously award Mr. Hartwell the Second Prize of $20 for his vineyard, and call your attention to his statement subjoined.

To the Garden Committee of the Massachusetts Horticultural Society:—

GENTLEMEN,—The vineyard of Moore's Early grape vines offered by me for your inspection and the Society's prize was planted in the spring of 1881, the vines being then two years old and set in rows nine feet apart, and eight feet apart in the row. The location of the vineyard is on high warm land, naturally well drained; the soil is a gravelly loam, with numerous large stones both above and below the surface;—which inclines slightly to the eastward. For the past three years no other crop has been raised on the ground; and no manure has been applied, except about five barrels of ground bone and muriate of potash,—two parts of the former to one of the latter mixed, and applied broadcast each year. The first two years the vines were tied to stakes and two buds allowed to grow. In the spring of 1883 trellises were built by setting locust posts at each end of each row, and also along the rows, leaving two vines in each space between the posts. Four strands of No. 14 wire were stretched and fastened by means of staples to each row of posts, the upper wire being about five feet from the ground.. The end posts were braced to keep the wires straight. To these wires the arms of the vines, from four to six in number, each from three to four feet long, are tied, care being taken to distribute the arms as evenly as possible over the wires. I very seldom tie to the upper wire, as I prefer to have the foliage on it shade the fruit on the other wires. I find it unnecessary to do any summer tying, and do very little summer pruning, but usually cut off the ends of branches inclined to grow between rows, so that the rows will look tidy, and leave the spaces clear for cultivation,—which is kept up with the cultivator and hoe until August, or as long as the weeds continue to grow. The vines have fruited three years: in 1883 they produced about one thousand pounds of fruit; in 1884 about five thousand five hundred pounds, and in 1885 about nine thousand pounds. I have always commenced to pick for market from the 5th to the 10th of September; at the latter date the fruit is ripe enough to pick clean. I prune the vines in November and December, leaving from four to six arms of strong, new wood three or four feet long, as near the roots as convenient. I tie these arms to the wires in mild days in winter, or in early spring.

By the above method, I find most of the work can be done at the time of the year when I have most leisure.

Respectfully submitted by

SAMUEL HARTWELL.

LINCOLN, October 15th, 1885.

In addition to our observations of the vineyard, we were particularly interested in noticing the culture of the Melon, to which Mr. Hartwell has given special attention, and the qualities of which ample opportunity was afforded the Committee to test. So favorably were we impressed with the result, that we induced Mr. Hartwell to give us a statement of his mode of cultivation, which we append, and the Committee unanimously award him a gratuity of $10 for successful culture of the melon.

JOHN G. BARKER, *Chairman of the Garden Committee of the Massachusetts Horticultural Society:*—

DEAR SIR, — At your request I make a short statement of my method of planting and caring for the crop of Greenflesh Melons your Committee saw on my farm early in September last. The ground is what is termed "old," having been planted four or five years; the soil is a gravelly loam, naturally dry, with the surface inclining to the eastward. It was manured with eight or ten cords of stable manure, broadcast and ploughed in. The seed was saved by myself from well selected stock, which, for want of a better name, I will call the Early Montreal, and was planted under glass the first week in May. For convenience in transplanting, I made two hot-beds of eight sashes each, locating them quite centrally in the field; planted eight seeds in each hill, allowing to it a space of about six inches square in the bed, and watered and aired as needed. The land was furrowed both ways, about five feet apart, and at each intersection of the furrows a place was dug with a hoe in which to set a hill. I like to have the plants set as fast as the holes are dug, so as to have the earth as fresh as possible. When ready to set the plants (which is usually from the 5th to the 10th of June), after being careful to have the ground in the hot-bed well wet and kept wet while planting, a piece of stove pipe about six inches long, to which an iron handle has been riveted, is pressed down over a hill, a spade is

forced under the hill, and, with one hand holding the spade and the other the handle to the pipe, the hill is carried to its allotted space in the field. After the hill is set in the hole dug to receive it and the spade withdrawn, I draw the loose earth around the pipe on all sides, and then withdraw the pipe. I then press down the earth around the hill, and with a hoe draw as much more as is needed about the plant. I continue thus with each hill, always being careful not to disturb the earth about the roots of the plants. When they are well established, I thin to three vines in each hill, cultivate and keep clean, and in due time expect to "reap if I faint not."

Respectfully submitted.

SAMUEL HARTWELL.

LINCOLN, MASS., October 15th, 1885.

THE ARNOLD ARBORETUM.

Our next visit was on the 26th of August, to the Arnold Arboretum, first stopping at the residence of our Treasurer, by whom the Committee were hospitably entertained. After a delightful drive through the pleasant avenues of Jamaica Plain, we found ourselves at the Arboretum of Harvard College, which contains one hundred and sixty-five acres of land, quite varied in character. This is a portion of the well known Bussey Farm, in that part of Boston formerly known as West Roxbury, and is within a few minutes walk of the Forest Hills station on the Boston and Providence Railroad, making it of easy access to visitors. The location is such that the experiments here made will be of great value to New England, and of general interest to a large portion of the whole country. The Arboretum is yet in its infancy, having been commenced only in 1874, when the seeds of the first trees were planted; so that excepting the older trees previously on the place, of which there are many, a great portion are only nursery plants, which on account of certain arrangements made with the city of Boston could not be planted in permanent positions until the laying out of some of the roadways had been completed. This being accomplished in part, the coming spring will see many of the botanical orders planted where they are to remain permanently, the planting being as far as possible in botanical sequence. Along

the roadways will be planted both native species and those of foreign introduction, including all the varieties, so that even one not possessing special botanical knowledge can at a glance comprehend the arrangement and see by comparison the plants which best endure our climate. The Arboretum will thus be a living museum, where the nurseryman, gardener, and private land-owner may come for trustworthy information regarding all trees or shrubs, which will save them the cost of personal experiments, and of delays caused by unfortunate selections.

The collection of living plants at the Arboretum is richer in species than any other in the United States; numbering at the present time over two thousand species and varieties of woody plants. Many of these may prove failures; but it is the work of the Arboretum to show by living illustrations what to select and what to avoid. The collection is being continually increased by a system of exchanges with botanic gardens and similar institutions, both public and private, in every part of the world within the temperate zone. Experiments are also being made with seeds of plants taken from widely different localities, with the hope that additions may be made to our lists of hardy trees. This has already been done in several instances, such as *Abies concolor*, *Pseudotsuga Douglasii*, and several others; the seeds of those plants brought from the warmer parts of the Pacific coast having proved of little use to us, in our changeable climate, while seeds from plants of the same species growing in Colorado under conditions similar to those in New England have produced plants which, so far, stand our climate as well as our native trees.

Besides planting the living specimens, there has been established a Herbarium; containing an abundance of specimens of woody plants, collected from various parts of the world, and plants of the same species from different localities, to aid students and others in determining the names of species and the effect of climate and location. There will also be a large collection of all kinds of woods, barks, cones, and other tree productions that may be of use in the arts or sciences. These collections are already very rich in American species, and require a great number of botanical cases to preserve them. They are at present stored in a house owned by Professor Sargent, kindly loaned by him for this purpose until such time as a proper building shall be erected on the Arboretum grounds.

The sources whence seeds are received from time to time are recorded in a set of books kept for this purpose. They are numbered in regular order, and by a systematic arrangement notes are made as to their hardiness, adaptability, usefulness, etc., which in future will be of great benefit in determining the history of these plants, and will form likewise a history of the Arboretum.

The records kept at the Arboretum show that several thousand plants are annually exchanged with individuals, botanic gardens, agricultural colleges, and other institutions, not only in this country but in Europe, Asia, North Africa, St. Helena, Japan, the Sandwich Islands, and elsewhere. So wide a dissemination of plants must be productive of good results.

The past season a Shrub Garden has been made comprising about two and one-eighth acres, laid out in beds ten feet wide, by two hundred and seventy-five feet long, sufficient in extent for 1,157 species and 357 varieties. The shrubs are systematically arranged, beginning with the order Ranunculaceæ, and ending with Smilaceæ; and not only botanically, but, as far as possible, geographically, American plants coming first. Here any one with even a limited knowledge of plants can take notes of these growing specimens, which will enable him to gain more knowledge than months or even years of study from books or catalogues could give, and will help him to make such selections as he would like to plant. All this is done at the expense of the Arboretum, thus giving all who wish to avail themselves of its privileges and advantages a real school of instruction free of all cost; and this will go on from generation to generation. No other such place is known where such valuable information can be similarly obtained; while Mr. Dawson, the skilful gardener, is always ready to impart any knowledge in his possession.

There are spaces left open for undetermined varieties, but the garden now contains 690 species and 250 varieties, with the possibility that from four to six hundred new species or varieties will be added the coming year. This location was mowing land, and was broken up only a year ago, and it is really astonishing to note what has been accomplished in so short a time; we can look upon this branch of the Arboretum work as one of the noblest educational agencies existing in any country.

Among the larger orders planted are fifty species of Spiræas and thirty-two varieties; thirty-four species of Clematis; twelve species of Euonymus and nine varieties; fifteen species of Rhamnus; fourteen species of Caragana and three varieties; forty-four species of Prunus and nineteen varieties; fifty-two species of Roses and eighteen varieties; nineteen species of Blackberries and twenty-four varieties; twenty-eight species of Philadelphus; twenty species of Ribes; fourteen species and seven varieties of Cornus; twenty-one species of Snowballs and three varieties; thirty-one species and eleven varieties of Honeysuckles; twelve species and three varieties of Huckleberries and Blueberries; sixteen species and five varieties of Rhododendrons; nine species and thirteen varieties of Ericas; and fourteen species and thirteen varieties of Lilacs.

The use of the present grounds, however, is only a temporary arrangement, the future demanding a larger and more permanent place.

The coming year will also witness much progressive work on the Public Park, in the way of planting: mostly of Coniferous trees such as Picea, Abies, Larix, and Pinus. These are to be planted in single specimens and groups. Those of the best known utility will be planted for permanent effect, while unknown varieties will be so distributed that, in case they fail or prove unsuitable, they can be removed without defacing or marring the permanent planting; the effect in landscape being also carefully looked after. It is the intention to give the preference to American trees in large groups and single specimens, while native shrubs will be planted as an undergrowth of the larger trees. For this purpose over sixty-two thousand plants were collected last fall, comprising all the best native shrubs in the New England States. Many thousands were planted in the spring of 1885, the most noticeable perhaps being at a point on the right of the entrance to the Arboretum, planted with White Pines to correspond with the magnificent Hemlock grove on the opposite side. Within the last five years miles of boundary belts have been planted, comprising all the native trees as far as possible; and a grove of *Pinus resinosa* (the Red Pine), to the number of fifty or sixty; which in ten years will make a fine appearance. This is one of the most beautiful American conifers, and is well deserving of more

general cultivation both for ornament and timber. A belt of trees facing the shrub garden is worthy of especial mention as containing many fine specimens over twenty feet high, where eight years ago was a barren sidehill. The trees have certainly made a remarkable growth, and show how many equally unpromising locations might be utilized in a most effective manner.

There is a small span roofed greenhouse devoted mainly to propagating trees and shrubs in winter, by grafting, cuttings, and seeds; from ten to fifteen thousand are produced annually. In spring they are placed thickly in boxes, and as soon as established are allowed to harden off in the frame ground. In this ground are several deep pits where the plants are stored for the first winter; every available place is used, and a look into one of the pits a few days ago revealed a surprising quantity of young plants, which will take their places in the nursery rows another season.

Among the many promising trees our attention was particularly attracted by the following deciduous kinds:

Betula alba, several fine forms.

" *nigra*.

" *papyracea*.

Catalpa bignonioides.

" *Kœmpferi*.

" *speciosa*.

Cladrastis Amurensis.

Fraxinus Americana.— A remarkably fine form of this species, with beautiful foliage, bright and shining above and glaucous beneath, was especially noticeable.

Fraxinus Mandshurica.

" *potamophylla*.— This and the preceding are from Northern Asia and Japan.

Juglans Mandshurica.— This tree was raised from seed eleven years ago, and has borne several crops of fruit.

Phellodendron Amurense.— The Amoor Cork Tree. One of the two original plants raised from seed being pistillate, and the other staminate, seed was perfected. It is believed that this is the first that has been produced in this country.

Prunus Sibirica.

Quercus Daimio.

" *macrocarpa*.

Quercus palustris.

" *Prinos.*

" *Robur* (English Oak).— Many beautiful forms.

Syringa Japonica.— A very rare species of Lilac from Japan, flowering in the middle of July; the trusses are a foot or more in length and pure white. It is a small tree rather than a shrub.

Rhus sp.— A beautiful species from Japan.

Magnolia sp.— A very promising species from Japan, which seems to be more hardy than any we have here. The seeds of this and the two preceding were contributed by President Clark of the Massachusetts Agricultural College.

Pyrus.— There is a fine collection of species from Northern Asia and Japan, which are very beautiful in flower or fruit, such as *spectabilis*, *Toringo*, and *baccata*, and their varieties.

Of the Conifers we may mention

Abies brachyphylla, from Japan.

" *concolor*, from Colorado. This is one of the finest specimens in the Arboretum.

Abies Fraseri.

" *balsamea* var. *Hudsonica.*

Chamœcyparis (*Retinospora*) *obtusa* and

" " *pisifera*, and their varieties. There is no doubt that the many varieties of this plant in cultivation came from these two original species.

Juniperus communis aurea.

Picea alba.— A variety known in the nurseries as Maxwell's Golden Spruce.

Picea alba cærulea.

" *Engelmannii.*

" *excelsa* and its many varieties.

" *pungens* and its varieties, many of which are very handsome, and being quite hardy promise to become very desirable for general ornamental planting.

Pinus Bungeana.

" *excelsa.*

" *flexilis.*

" *Jeffreyii.*

" *Murrayana.*

" *parviflora.*

Pinus ponderosa.
" *resinosa.*
" *Strobus* and its several forms.
Pseudotsuga Douglasii, the Douglas Fir or Red Fir of Oregon.

Among the shrubs were many beautiful varieties from all parts of the world, to give a description of which would take more time than our hurried visit would allow, but we hope to add many notes of the Arboretum collection in the near future. In the meantime those desiring further information are referred to the TRANSACTIONS of the Society, Part I, 1881, pp. 83–87, and Part I, 1883, pp. 79–88, as containing a fuller account of many new shrubs introduced at the Arboretum than can be found in print elsewhere.

The following extract from the Bulletin of the Bussey Institution will be of interest to all, even if the facts are known to some: "In the spring of 1872, the President and Fellows of Harvard College received a gift of $100,000 from the trustees under the will of the late James Arnold, merchant, of New Bedford, Mass., for the purpose of establishing at the Bussey Institution, a professorship of tree culture, and creating and maintaining on the Bussey estate an Arboretum, which should ultimately contain, as far as practicable, all the trees, shrubs, and herbaceous plants, either indigenous or exotic, which can be raised in the open air at West Roxbury. At least two-thirds of the income of the fund is to be accumulated until the fund amounts to at least $150,000, and the Bussey estate (Woodland Hill), in West Roxbury, passes completely into the hands of the President and Fellows of Harvard College. A particular portion of the estate has been specified as the site of the Arboretum in the indenture which defines the object and terms of the gift, — a portion which contains about one hundred and thirty-seven acres, and is the finest part of the whole estate, as regards the variety of its soils, the beauty and variety of the trees already growing upon it, and the lay of the land. An arboretum is intended to educate the public as well as the special students who resort to it. When Woodland Hill comes into the possession of the President and Fellows, the Arnold Arboretum will doubtless be laid out as an

open park, with suitable walks and roadways. It can hardly fail to become a beautiful, wholesome, and instructive resort, which will be more and more precious as the population grows denser about it."

From still another point of view, the Professorship of Arboriculture and the Arboretum are substantial additions to the University. The cultivation and preservation of forests will become in no long time a matter of national concern. The natural forests of the country are already rapidly disappearing, and wood and timber at no distant day will be scarce and dear commodities, as they have long been in many countries in Europe.

In April, 1874, Mrs. Motley conveyed all her life interest in the Bussey estate to the President and Fellows of Harvard College, so that the whole estate is now at their disposal. In 1872, the first seed was planted for the Arboretum; but at that time and up to the spring of 1879 much of the work, such as the raising of plants, seeds, and cuttings, done at the Bussey Institution, was for the Botanic Garden at Cambridge, as well as for the exchanges of the Arboretum. Since 1879, the whole time has been devoted to raising plants for the Arboretum; and the number of new and rare plants propagated has rapidly increased.

In 1875, there were one hundred and twenty-eight species raised. In 1877, Mr. Sargent wrote that, judging from the immense number of letters which were annually sent him, there was a steadily increasing interest felt in the Arboretum. It was then but five years since its establishment; but its usefulness and influence were already evident, and to its influence could be traced the planting during that year of nearly a half million trees in the New England States.

In December, 1882, an arrangement was made with the Park Commissioners of the City of Boston, which, without interfering with the scientific aims of the Arboretum, will increase its local influence by freely opening its collections to the public, and by securing for it additional and greatly needed land, suitable and dignified approaches, and carriage drives.

The objects of the Arboretum may be definitely stated in a few brief words that all can understand. First, a school of Arboriculture for the study of trees and shrubs and their uses for timber,

for ornament, and otherwise. Second, a museum of living specimens of all ligneous plants that will stand the climate at West Roxbury, planted and arranged in botanical order. Third, a museum for reference, containing a dried collection of all ligneous plants, properly labelled with the time of flowering, native location, and, if foreign, the country where they are indigenous; also a full collection of specimens of wood, bark, fruit, seeds, etc. Fourth, a library containing all the best works on Dendrology, for the use of students or others interested in the science of tree culture.

In closing this somewhat lengthy yet inadequate account of our visit to the Arboretum, we must not omit to say that its success is due to the untiring and indefatigable labors of the Director, Professor Charles S. Sargent, whose large correspondence, and thorough knowledge of all that pertains to the duties of his office, have already given to the horticultural world one of the grandest educational institutions this generation has been blessed with. We sincerely hope he may be as successful in the future as he has been in the past, in the introduction of so many of the most beautiful trees and shrubs to adorn our parks and gardens. We desire also to acknowledge the courtesy and kind attention of Mr. Jackson Dawson, the gardener at the Arboretum, who so generously gave us his time and valuable information which has enabled us to make this report.

The Committee award to Mr. Dawson a gratuity of $20 for skilful propagation and culture of hardy trees and shrubs.

Boston Asylum and Farm School.

The last visit of the season was to the Boston Asylum and Farm School for Indigent Boys, at Thompson's Island. The products of the Farm were seen at our Annual Exhibition, in the Vegetable department, to which it contributed many choice and well grown specimens. While it has not much to call attention to in a strictly horticultural way, we are glad to know and to speak of the value of this institution, its objects being to relieve and to instruct and employ indigent boys; — the education and reformation of boys who, from loss of parents or other causes, are exposed to extraordinary temptations and are very liable to become vicious and dangerous or useless members of society.

The island contains one hundred and fifty acres, of which one hundred are under cultivation, a large part of the work being done by the boys, who thus acquire a practical knowledge of husbandry. In the school the studies taught are reading, spelling, writing, written and mental arithmetic, geography, grammar, history, etc. Vocal and instrumental music are also taught, and carpenters' tools, a small forge, and a printing press with the necessary outfit, have been provided, and everything is done to make the boys a credit to the institution and themselves when they go out into the world.

The evidence of thorough training and good care of the boys is found in the fact that the Superintendent says, "Wherever we send our boys others are wanted, and the demand in late years has been greater than the supply." In justice to the institution, one thing should be mentioned: — it is not a penal or pauper establishment.

Thompson's Island, on which it is placed, is four miles down the harbor, and has proved a very healthy spot. We were surprised to see such an excellent growth of evergreen and deciduous trees, as well as a very fine orchard of pears and apples. We are greatly indebted to the excellent and justly respected Superintendent, Mr. William A. Morse, for his invitation to visit the Farm and School, and for the kind attentions which made the visit so pleasant. We take great pleasure in calling the attention of all to the good work done there, and sincerely wish that all the members of the Society may take the opportunity when offered to go and see for themselves.

In closing this Report, the Committee desire to call attention to the changes in the Schedule of Prizes, which they find it necessary to recommend in view of another season; and they sincerely hope for the coöperation of the members of the Society in encouraging those who they know are adopting specialties in the lines for which the prizes are offered, to compete for the same. They will be glad to visit any place, or to note any object of horticultural interest, whether coming within the scope of the prizes or not. They also ask attention to the Hunnewell Triennial Premiums, and hope that competitors for them may soon appear. The Committee would be grateful for any suggestions that may tend to advance the objects for which it is appointed.

We recapitulate here the awards previously mentioned:—

To Mrs. Mary E. Goddard, for the best arranged and best kept Flower Garden, the prize of . . .	$20 00
To Jonas P. Hayward, for a Vineyard of one acre, the first prize, ...	30 00
Second prize to Samuel Hartwell, ...	20 00
Gratuities:—To Samuel Hartwell, for successful culture of Melons, ...	10 00
To Jackson Dawson, for propagation and skilful culture of hardy trees, plants, and shrubs, . . .	20 00

Approved by the Committee, December 26, 1885.

JOHN G. BARKER,
E. W. WOOD,
E. L. BEARD,
C. N. BRACKETT,
BENJ. G. SMITH,
HENRY W. WILSON,
CHAS. W. ROSS,
} *Garden Committee.*

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS,

FOR THE YEAR 1885.

In reviewing the record of the year, this Committee, as well as the members of the Society in general, have ground for mutual congratulation that the principal exhibitions, bringing returns to the treasury, as well as those to which the public are admitted free, have proved so successful. The attendance upon the former were without precedent; and there is every reason to expect a steady growth of public interest, especially if the Society adopts a liberal policy in providing for the accommodation of exhibitors and visitors. The receipts of the Spring Show were $833.65, of the Rose Show $402.65, of the Annual Exhibition $1,184.25, and of the Chrysanthemum Show $1,119.50; — making a total of $3,540.05. Each Exhibition has shown a decided increase as to receipts over the same for the previous year, except the Rose Show, which fell a few cents behind.

This is a marked improvement; and since the Spring Exhibition and the Chrysanthemum Show, for 1886, have each been lengthened to three days in place of two, reasonable expectation can be entertained of a further advance in the receipts. There has been no marked increase of expenses in holding these large exhibitions; and in some instances they have been reduced. It is well again to reiterate the necessity for some action looking to an increase of the hall accommodations of the Society, if our large exhibitions are to continue their growth; — as the limit of our resources in this respect has been reached. It is to be hoped that the Society may be enabled to solve this question in some satisfactory manner. The Committee wish in this connection to

speak in most favorable terms of the assistance rendered them by the present Janitor of the Hall. His aid in the prompt arrangement of the various exhibitions, has been invaluable. The Committee also have liberal aid from the newspapers of the city, and their full reports of the exhibitions have been of the greatest service to us.

It is evident that the arrangements at the larger exhibitions would be greatly facilitated if some system for the preliminary entry of collections of Plants and Flowers could be adopted, and if in all cases exhibitors gave formal notice of their intention to show in certain classes. This is to be recommended in view of the great increase of exhibits, and the consequent difficulty in providing for their proper arrangement in time to open the Hall to the public. If a blank form should be adopted, and every exhibitor be required to fill up and forward this to the Committee of Arrangements a few days before each large exhibition, there would be less confusion, and the labors of the Committee would be reduced. Exhibitors would not be likely to approve this change at first; but, in a short time, the system could be made to work advantageously for all.

Another desirable innovation, which may not be received favorably, is one which would require the members of the various Committees who are on duty in the Hall, at the time of the large exhibitions, to wear some badge of office. This suggestion is prompted by the fact that, since these exhibitions have grown to such large proportions, hundreds come to our halls seeking information in regard to plants, flowers, fruits, and vegetables hitherto unknown to them. It is the duty of the Society to provide some way of making this information accessible; and, while the members of Committees have no distinguishing mark of office, our visitors, as experience has shown, do not know to whom to address their inquiries, and often leave the hall without having gratified their desire for knowledge. The course suggested might impose some trifling additional labor upon members of the Committees, but it would meet a very positive necessity, and would promote the growth of horticulture by diffusing information on the subj ct.

Respectfully submitted.

EDWARD L. BEARD, *Chairman.*

REPORT

OF THE

COMMITTEE ON THE MEETING

OF THE

AMERICAN FORESTRY CONGRESS.

The Committee appointed to extend courtesies to the American Forestry Congress make the following report:

The Congress held its sessions in the Society's large Hall, on the 22d, 23d, and 24th of September last. Distinguished gentlemen from various States of the Union and from the Dominion of Canada were present; and able papers were read, relative to the important subject of Forestry. It is believed that by these proceedings a good degree of public interest was awakened in regard to the cultivation and preservation of our Forests, as having a direct influence upon our climate, and also affecting the very quality of our soil. As the subject has such an intimate and important bearing upon the interests of horticulture, it was eminently fitting that our Society should join with others in extending hospitalities to the members of the Congress.

Visits to the Arnold Arboretum, the Middlesex Fells, and other places of interest, were made at intervals between the sessions. By the courtesy of the Mayor of Boston, a most enjoyable excursion down the harbor and a visit to the public institutions was also afforded to our guests. A visit to the extensive and instructive forest plantations of Mr. Joseph S. Fay, on the seacoast, at Wood's Holl, closed the entertainment provided for the Congress. For these courtesies a most hearty vote of thanks was passed, and especially to this Society for the use of its Hall and Rooms, and to your Committee as its representative.

WM. C. STRONG,
WM. H. SPOONER,
BENJAMIN G. SMITH,
} *Committee.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION

FOR THE YEAR 1885.

In compliance with the usual custom, the Committee on Publication and Discussion submit the following report:

The Committee have labored with perhaps increased diligence during the past year in promoting the interest of the weekly meetings for essays and discussions. They have been greatly aided in their work, not only by the members of the Society, but by gentlemen outside its membership, who have contributed papers replete with information and experience. Their very valuable essays, and the ensuing discussions on topics pertaining to horticulture and its kindred interests, have not only been extensively copied in horticultural papers in this country, but also in European journals.

The subjects for discussion the past year have been especially horticultural,— at the same time embracing that variety which is conducive to a proper knowledge of well-ordered gardening and planting. The discussions, following the essays, have manifested an increasing interest on the part of members; and also the greater freedom of expression that weekly practice is sure to impart.

For the result of the labors of the Committee during the past year, reference may be had to the TRANSACTIONS. These, with the valuable assistance afforded by Mr. Edward Frost to the efficient Secretary, have been completed up to date, and distributed to members and others entitled to receive them.

The Committee desire to call the especial attention of all members not already provided with the HISTORY OF THE SOCIETY, to the importance of having a copy, which can be done at a price only

sufficient to cover the cost of making the book. The sale thus far has not met the hopes and expectations of the Committee, who believe that, were the interest and value of this work sufficiently known, every member would desire to possess a copy.

Members having but partial sets of the Transactions of the Society can have those necessary for completing them as far back as 1865, by making application to the Secretary.

The Committee during the last year departed from the former plan of offering prizes for essays on given subjects, and tried that of engaging experts to prepare papers on their specialties in horticulture. In the judgment of the Committee this course has produced better results than the offer of prizes. They have expended $120 out of the appropriation of $200.

The Committee were charged by the Society with the duty of awarding the prizes offered for the best reports of the Committees to award prizes for horticultural products; and, after a careful examination of the reports submitted, have awarded the First Prize of $10 to John G. Barker, for the Report of the Committee on Gardens. The Second Prize of $8 to Edward L. Beard, for the Report of the Committee on Plants and Flowers. The Third Prize of $6 to E. W. Wood, for the Report of the Committee on Fruits.

Respectfully submitted.

O. B. HADWEN,
FRANCIS H. APPLETON,
WM. H. HUNT,
} *Committee.*

REPORT

OF THE

COMMITTEE ON THE LIBRARY,

FOR THE YEAR 1885.

There has been little in the affairs of the Library during the present year which needs especial notice. The income of the Stickney Fund and the Society's appropriation have been expended in the usual manner; the Card Catalogue has made the same progress as last year — as much, that is, as the amount expended upon it would lead us to expect; and the List of Accessions to the Library which will be published with this report will show that the rate of increase has been about the same as in former years.

Very early in the year an impression was found to exist that the library was declining in usefulness, although, year by year, it was increasing in bulk; that not only were the books less consulted but many useless ones were bought. These criticisms are such as any member has a right to make. The Committee on the Library understands that it is responsible to the Society for its acts, and that any mistake or negligence ought to be promptly noticed. It deems itself fortunate in having had ten months to consider the first of these criticisms,— that the books are less used,— for it has been able by observation and inquiry during that time to discover that such is not the case. The idea arose from the fact that the number of entries in the Librarian's record-book have decreased during the last few years; but, had the examination of these entries been carried further back, it would have been found that their number has always fluctuated, sometimes falling off to a remarkable extent in a single year, only to overrun its former limit in another year or two. For instance, in 1874 the number of books taken out was seven hundred and fifty-eight; in 1875 it was

only five hundred and two, while in three years more it had risen to seven hundred and ninety-eight. It is plain, therefore, that no inference can be drawn from two or three years' record. The largest numbers of entries are those which antedated the custom of Saturday discussions; and it is very likely that such numbers will not be again reached for some time; perhaps not at all:—the discussions to some extent supplying the information previously furnished by this library.

But this Committee does not regard the record of books taken out as being of very great importance in showing the actual use of the library, for who knows whether a book taken out is read wholly or only in part? Moreover books vary greatly in importance, yet all make the same show on the book of entries. We base our opinion that the library is more used from year to year upon the very great increase of study and reading in the library room. To determine this point we have made very frequent observations and inquiries, and all the evidence is toward one conclusion,—that which we have just pronounced.

The second of the criticisms to which we have referred,—that many useless books are bought,—is easily met. Any book is useless to him who has no use for it, and we have probably no member who cares to use *every* book in the library; but he must be a very reckless person who shall use the word in its broad sense, and declare that any book we have is of no use to any one.

Probably this criticism arises from the fact that many books are bought whose bearing upon practical horticulture is not very apparent, such as herbals, floras of various countries, monographs of natural orders of plants, works on systematic botany, geographical distribution, and the like. In explanation, we can state that we watch publishers' announcements, book notices, etc., closely, and neglect nothing that appears to be of a so-called "practical" nature and worth procuring; also that we have bought every book that has been asked for during the year, whenever we could without disobeying the wise restrictions imposed by Mr. Stickney. If any of these purchases appear, to some, superfluous, they should remember that a large proportion of our members are persons whose interest in horticulture is of a scientific or literary nature only, and so long as these members pay their assessments, they have a perfect right to expect that their tastes and wants shall be considered.

There is probably no library, above the level of circulators of fiction, which has not many books that have never been opened since the day they were bought, but all such are only waiting their time; for them the hour may come, and the man, by whom and in which they may be found almost indispensable.

If exception be taken to some of our books on the ground of their being in foreign languages, it must be borne in mind that most of these have illustrations which anybody may understand; and that there are not more than two works in languages not familiar to many of our members. One of the two is in Russian,— it cost us nothing, being a gift; the other is Japanese and consists almost entirely of plates.

The exhibitions of this Society are models of their kind; our prize lists are of unexampled liberality; our discussions, beside being attended by as many as this room will hold, are frequently reprinted in foreign journals: we believe that our library is an agency not inferior to either of these in causing the Society to be respected and appreciated; containing, relatively to its size, a peculiarly valuable collection of books, and being open freely to any one who desires to study here.

There is one more subject upon which our duty will not allow us to be silent, although it is the very familiar one of library accommodations. Everybody can see the state of affairs. Books crowded and jammed into receptacles which can properly hold not more than two-thirds of their present contents: others, very valuable and useful ones, put into cases at the top of the librarian's room, difficult to reach by the really dangerous ladder, and almost impossible to be taken down; others stowed in an upper room, and of no use at present because of their inaccessibility.

This Committee has taken great pains to inquire into the best way of obviating the difficulty. Plans and estimates have been secured, consultation has been had with a competent architect, and yet the end of the year finds us worse off than the beginning. It is absolutely necessary that something be done.

For the Committee,

W. E. ENDICOTT, *Chairman.*

LIBRARY ACCESSIONS.

Books Purchased.

Gray, Asa, LL.D., etc. Synoptical Flora of North America. Vol. 1, Part 2. Large 8vo. New York, London, and Leipsic: 1884.

Hemsley, W. B. Biologia Centrali-Americana. Parts 18 and 19, February and November, 1885, in continuation. 4to. 6 plates. London.

Martius, C. F. P. de. Flora Brasiliensis, etc. Fasc. 93, in continuation. Folio. Plates. Leipsic: 1885.

Hooker, Sir William Jackson, K. H., D. C. L. Oxon., F. R. A., and L. S., etc. The British Ferns, or Coloured Figures and Descriptions, etc., of the Ferns of Great Britain and Ireland. With drawings by Waldo Fitch, F. L. S. 8vo. 66 colored plates. London: 1861.

Willkomm, Maurice. Illustrationes Floræ Hispaniæ, Insularumque Balearum. Livraisons 7–10, completing tome 1. 4to. 36 colored plates. Stuttgart: 1883.

Pierre, L., Directeur du Jardin Botanique de Saïgon. Flore Forestière de la Cochinchine. 7e fascicule, in continuation. Large folio. 15 plates. Paris: 1885.

Hamilton, Francis, M. D, F. R. S., and L. S. Commentary on the Hortus Malabaricus. 4 pamphlets. 4to. [Extracts from the Transactions of the Linnean Society.]

Baldwin, Henry. Orchids of New England. A Popular Monograph. 8vo. 40 wood-cuts. New York: 1884.

Fitzgerald, R. D., F. L. S. Australian Orchids. Parts 7 and 8, in continuation. Large folio. 20 colored plates. Sydney, New South Wales: 1882.

Mueller, Baron Ferd. von. Eucalyptographia; 10th decade, completing the work. 4to. 10 plates. Melbourne: 1884.

Lambert, Aylmer Bourke, F. R. S., etc., etc. An Illustration of the Genus Cinchona; embracing also dissertations, etc., by Baron de Humboldt, Laubert, and Don Hippolite Ruiz, on Cinchona Forests, Species of Quinquina, and various Medicinal Plants of South America: and an account of the Spikenard of the ancients. 4to. 5 plates. London: 1821.

Naudin, Ch. Recherches sur les Cucurbitacées. [Extraits des Annales des Sciences Naturelles.] 8vo. 21 plates. Paris: 1856–1866.

Klotzsch, J. F. Begoniaceen Gattungen und Arten. 4to. 12 plates. Berlin: 1855.

Nicklès, Napoléon, pharmacien. Notice sur les Gladiolus de France et d' Allemagne. 4to. pamphlet. 1 colored plate; n. d.

Trinius, Karl Bernhard. Species Graminum Iconibus et descriptionibus illustratæ. 3 vols. 4to. 360 plates. St. Petersburg: 1828.

Palisot de Beauvois, A. M. F. J., Membre de l'Institut, etc. Essai d'une nouvelle Agrostographie; ou nouveaux genres des graminées; avec figures representant les caractères de tous le genres. 8vo., with 4to. atlas of 25 plates. Paris: 1812.

Reichenbach, Ludovico. Iconographia Botanica Exotica, sive Hortus Botanicus, imagines plantarum imprimis extra Europam inventarum colligens, cum commentario succincto editus. 4to. 250 colored plates. Leipsic: 1827–1830.

Dodoens, D. Rembert. A Nieuwe Herball, or Historie of Plantes: the whole discourse and perfect description of all sortes of Herbes and Plantes. Translated from the French by Henry Lyte, Esquyer. Black Letter folio. Many wood-cuts. London: 1578.

Goodale, George Lincoln, A. M., M. D. Physiological Botany [to form vol. 2 of "Gray's Botanical Text Book"]. Part 1. Outlines of the Histology of Phænerogamous Plants. 8vo. New York and Chicago: 1885.

De Bary, Dr. A., Professor, etc. Comparative Anatomy of the Vegetative Organs of the Phanerogams and Ferns. Translated and annotated by F. D. Bower, M. A., F. L. S., etc., and D. H. Scott, M. A., Ph. D., etc. 8vo. 241 wood-cuts. Oxford: 1884.

Sketches of the Physiology of Vegetable Life. By the authoress of "Botanical Dialogues." 8vo. London: 1811.

Smith, Lady, Editor. Memoir and Correspondence of the late Sir James Edward Smith, M. D., F. R. S., etc., etc. 2 vols. 8vo. With engraved frontispiece. London: 1832.

Pratt, Anne. Haunts of the Wild Flowers. With illustrations. 16mo. London and New York: n. d.

Catlow, Agnes. Popular Garden Botany; containing a familiar and scientific description of most of the hardy and half-hardy plants introduced into the flower-garden. Square 12mo. 20 colored plates. London: 1855.

Linnean Society, Journal of the. Vol. XX, Nos. 130, 131. Vol. XXI, Nos. 132–139, in continuation. 8vo. London: 1884, 1885.

Miller, William. A Dictionary of English Names of Plants, applied in England and among English-speaking People to Cultivated and Wild Plants, Trees, and Shrubs. In two parts, English-Latin and Latin-English. 8vo. London: 1884.

Knight, Thomas Andrew. A selection from his Physiological and Horticultural Papers, published in the Transactions of the Royal and Horticultural Societies. With a sketch of his Life. 8vo. Portrait and plates. London: 1841.

Hooker, Sir William Jackson. Copy of a letter addressed to Dawson Turner, Esq., F. R. A. and L. S., etc., etc., on the occasion of the death of the late Duke of Bedford, particularly in reference to the services rendered by His Grace to Botany and Horticulture. Printed for private distribution. 4to. Colored plate. Glasgow: 1840.

Candolle, Alphonse de. Origin of Cultivated Plants. Small 8vo. London: 1884.

Warner, Williams, and Moore's Orchid Album. Vol. 4, Parts 43–48; Vol. 5, Parts 49–52, in continuation. 4to. 40 colored plates. London: 1885.

Lindenia; Iconographie des Orchides. 1ere volume, 1ere livraison (mensuelle), J. Linden, Directeur. Small folio. 4 colored plates. Gand: mai, 1885.

Curtis, Henry. Beauties of the Rose. Volume 2. 4to. 18 colored plates. Completing the work. London and Bristol: 1853.

The Rosarian's Year-Book. for 1885. Small square 8vo. London: 1884.

Lemaire, C. Le Jardin Fleuriste, journal général des progrès et des intérêts horticoles et botaniques, etc. 4 vols. large 8vo. Woodcuts and many colored plates. Gand: 1851–1854.

Baines, Thomas. Greenhouse and Stove Plants, Flowering and Fine-Leaved Palms, Ferns, and Lycopodiums; with full details for propagation and cultivation. 8vo. London: 1885.

Hogg, Robert, LL.D., F. R. S., etc. The Herefordshire Pomona, containing colored figures and descriptions of the most esteemed kinds of Apples and Pears cultivated in Great Britain. Part 7, completing the work. Folio. London and Hereford: 1884.

Salisbury, William. Hints, addressed to Proprietors of Orchards, and to growers of fruit in general. 12mo. 2 plates. London: 1816.

Fruits, Nuts, and Wine. By various writers. 8vo. pamphlet, pp. 315–450. Colored plate. [From the Report of the U. S. Patent Office, 1856.]

Roessle, Theophilus. How to cultivate and preserve Celery. Large 8vo. 4 colored plates. Albany: 1860.

Pennsylvania Horticultural Society. Transactions. 1 vol. 8vo. Philadelphia: 1839–1844.

Indiana State Horticultural Society. Annual Report; Proceedings of the Ninth annual session, held at Indianapolis, January 4–6, 1870. 8vo. Indianapolis: 1870.

Gerard, John. A Catalogue of Plants cultivated in his garden in the years 1596–99. Edited, with notes, references to Gerard's Herball, the addition of modern names, and a memoir, by Benjamin Daydon Jackson, F. L. S. 4to. Privately printed. London: 1876.

Royal Gardens at Kew, Reports on the progress and condition of, for the years 1876, 1878, 1879, 1881 and 1882. 5 pamphlets, 8vo. London.

Chelsea Botanick Garden,—Memoirs, Historical and Illustrative, of the. 8vo. London: 1820.

Brooke, E. Adveno. The Gardens of England. Large folio, with many vignettes and colored plates. London: 1857.

City of Boston, Report, and accompanying statements and communications relating to a Public Park for: being City Document No. 123, 1869. Also, No. 15, 1879; No. 118, 1880, with chart; Nos. 23, 124, 1881; No. 148, 1882 and No. 150, 1883, relating to the same.

Brooklyn Park Commissioners, Twelfth and Thirteenth Annual Reports. 2 pamphlets, 8vo. Plates. Brooklyn: 1872, 1873.

Fairmount Park, Philadelphia, Description of Plan for the Improvement of, by Sidney & Adams: adopted by City Councils. 8vo pamphlet. Philadelphia: 1859.

——— ———. Fourth Annual Report of the Commissioners of. 8vo. pamphlet, with plates. Philadelphia: 1872.

Scottish Arboricultural Society, Transactions of the, for the years 1857–1880. 9 vols. 8vo. Plates, etc. Edinburgh.

Forestry and Forest Products: prize essays of the Edinburgh International Forestry Exhibition, 1884: edited by John Rattray, Botanist to the Scottish Marine Station, and Hugh Robert Mill, Chemist to the same. 8vo. Many cuts and plates. Edinburgh: 1885.

Liebmann, F. M. Chênes de l' Amerique Tropicale. Iconographie des espèces nouvelles ou peu connues (ouvrage posthume, achevé et augmenté d' un aperçu sur la classification des chênes en général, par A. S. Oersted). Folio. 47 plates. Leipsic: 1869.

Arboretum Segrezianum: Icones Selectæ Arborum et Fruticum in Hortis Segrezianis collectorum. Livraison 6, completing the work. Folio. 6 plates. Paris: 1885.

Maximowicz, C. J., Socius Academiæ. Rhododendreæ Asiæ Orientalis: forming Tom. 16, No. 9, of "Memoirs de l' Académie Imperiale des Sciences de St. Petersbourg." 7th series. 4to. pamphlet. 4 plates. St. Petersburg: 1870.

American Agriculturist. Vols. 1 and 2, bound together, and Vols. 9 and 10, bound together; being for the years 1842 and 1843, 1850 and 1851, 8vos, — also, Vol. 23, 1864, 4to. Illustrated. New York. [Towards completing the set].

Journal of the New York State Agricultural Society. Vol. XI, Nos. 1, 4, 7, 9: also Vol. XII, No. 12. Albany: 1860 and 1862. [Towards completing the set].

Agricultural Review and Journal of the American Agricultural Association. Quarterly. January, 1882. Vol. 2. No. 1. New York. [Towards completing the set].

The Semi-Tropical, a monthly journal, devoted to Southern Agriculture and Horticulture and to Immigration. Vol 1, Nos. 1 and 3, for September and November, 1875. Jacksonville, Florida. [Towards completing the set].

Ontario School of Agriculture and Experimental Farm. Third Annual Report, for the year ending December 31, 1877. Large 8vo. Toronto: 1878. [Towards completing the set].

Royal Agricultural Society of England. Journal. Second Series. Vol. 20, Part 2, October, 1884, and Vol. 22, 1885. 8vo. London.

Christy, Thomas, Jr., F. L. S. Forage Plants, and their economic conservation by the new system of "Ensilage." Part 1, Caucasian Prickly Comfrey; Part 2, Balsamocarpon, and other plants containing Tannin. 8vo. pamphlet. 2 colored plates and wood-cuts. London: 1877.

Christy, Thomas, F. L. S., F. S. C. I., etc. New Commercial Plants and Drugs. No. 8, in continuation. 8vo. Wood-cuts and colored plate. London: 1885.

Cooke, M. C. Illustrations of British Fungi. Parts 26–36, in continuation. 8vo. Colored plates 405–580. London: 1884, 1885.

Lesquereux, Leo, and Thomas P. James. Manual of the Mosses of North America: with six plates, illustrating the genera. 8vo. Boston: 1884.

Walsh, Benjamin D., State Entomologist. First Report on the Insects injurious to vegetation in Illinois. 8vo. pamphlet, 1867.

United States Consular Reports. Nos. 8 and 14, June and December, 1881. Nos. 16 and 18, February and April, 1882. Reports from the Consuls of the United States on the Commerce, Manufactures, etc., of their Consular Districts. Published by the Department of State. 4 pamphlets. 8vo. Washington: 1881, 1882. [Towards completing the set].

Books, Etc., Received by Donation and Exchange.

Thomas, John J. The American Fruit Culturist: Revised Edition. 12 mo. 519 wood-cuts. New York: 1885. The Author.

Strong, W. C. Fruit Culture, and the Laying Out and Management of a Country Home. 12mo. 84 wood-cuts. Boston: 1885. The Author.

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Kansas State Agricultural College. Report of the Professor of Agriculture. Experiments, 1884. 8vo. pamphlet. Manhattan, Kansas: 1885. Two copies. Also, the Annual Catalogue, 1884–85. F. Nihart, Librarian.

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Scientific Association, Meriden, Connecticut. Transactions for 1884, being Vol. 1. 8vo. pamphlet. Meriden: 1885. C. H. S. Davis, M.D.

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Brookville Society of Natural History. Bulletin No. 1. O. M. Meyneke and C. F. Goodwin, Editors. 8vo. pamphlet. Richmond, Indiana: 1885. The Society.

Illinois State Laboratory of Natural History. Bulletins Nos. 1, 2, 4, 5, and index bulletin. 5 pamphlets, 8vo. Completing Vol. 1. Bloomington: 1876–1884. Vol. 2, article 3, Parasitic Fungi of Illinois, Part 1, by T. J. Burrill. 8vo. pamphlet. Peoria: 1885. S. A. Forbes, Director.

Sedalia Natural History Society. Bulletin No. 1. 8vo. pamphlet. Sedalia, Missouri: August, 1885. F. A. Sampson, Corresponding Secretary.

Minnesota Academy of Natural Sciences. Bulletin, Vol. 2, Nos. 4 and 5, December 1882 and June 1885. 2 pamphlets. 8vo. Minneapolis, 1883, 1885.

Leopoldina, Amtliches Organ der Kaiserlichen Leopoldino-Carolinischen Deutschen Akademie der Naturforscher. Heft 20, for the year 1884. 4to. pamphlet. Halle: 1885. Dr. C. H. Knoblauch, President.

Gilbert, John Henry, M.A., LL.D., F. R. S., Sibthorpian Professor of Rural Economy in the University of Oxford. On Agricultural Investigation: — a lecture, etc., 1885. The Society for the Promotion of Agricultural Science. New Brunswick, N. J.

Penhallow, D. P., Prof. and B. Sc. Address delivered at the Convocation of McGill University, April 30, 1885. 8vo. pamphlet. Montreal.

Joly, M. Ch. Les Eaux d' Égout à Paris. 8vo. pamphlet. Paris: 1885. The Author.

L'Eau à Paris, No. 34, vingt-deuxième année de la Journal Illustré, 23 août, 1885. M. Ch. Joly.

United States War Department. Professional Papers of the Signal Service; No. 2, Isothermal Lines of the United States, 1871–1880, by 1st Lieut. A. W. Greeley, Acting Signal Officer; No. 7, Character of Six Hundred Tornadoes; No. 6, The Reduction of Air Pressure to Sea Level, at elevated stations west of the Mississippi River, by Henry W. Hazen, A. M.; with charts; No. 11, Meteorological and Physical Observations on the East Coast of British America, by Orray Taft Sherman; No. 15, Researches on Solar Heat, and its Absorption by the Earth's Atmosphere,— a report of the Mount Whitney Expedition, by S. P. Langley, director of the Alleghany Observatory. 4 pamphlets and one volume 4to. Published by authority of the Secretary of War. Washington.

United States Signal Service Notes, prepared under the direction of Brig. and Bvt. Maj. Gen'l W. B. Hazen, Chief Signal Officer of the United States Army. Nos. 12–14, 16–18, and 19, 22, 28. 9 pamphlets, 8vo. Washington: 1884, 1885. The Chief Signal Officer.

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Massachusetts Institute of Technology. Twentieth Annual Catalogue of the Officers and Students, with a statement of the courses of instruction, and a List of the Alumni and of the Society of Arts, 1884–1885. 8vo. pamphlet. Boston: 1884. The Institute.

Bowdoin College. Eighty-third and Eighty-fourth Annual Catalogues, for the Academical Years 1884–1885, and 1885–1886. 2 pamphlets. 8vo. Brunswick: 1884, 1885.

United States Bureau of Education. Circulars of Information, Nos. 6 and 7, 1884, and Nos. 1 and 2, 1885. Also Historical Sketches of the Universities and Colleges of the United States, edited by Dr. Franklin B. Hough; and Building for the Children in the South. 6 pamphlets, 8vo. Washington: 1883, 1884, 1885. Hon. John Eaton, Commissioner.

New England Historic-Genealogical Society. Address of Hon. Marshall P. Wilder and the other Proceedings at the Annual Meeting,

January 7, 1885. 8vo. pamphlet. Boston, 1885. Hon. Marshall P. Wilder.

American Antiquarian Society. Proceedings at the semi-annual meeting held in Boston, April 29, 1885. Vol. 3, New Series, Part 4. 8vo. pamphlet. Worcester, 1885. The Society.

Minnesota Historical Society. Biennial Report to the Legislature of Minnesota, Session of 1885. 8vo. pamphlet. St. Paul: 1884.

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Boston Asylum and Farm School for Indigent Boys, Thompson's Island. Report, etc. 8vo. pamphlet. Boston: 1883. Farm School Press. William A. Morse, Superintendent.

State Bureau of Labor Statistics. Report of Commissioners on the Industrial, Social, and Economic Conditions of Pullman, Illinois. 8vo. pamphlet. September, 1884.

Comptroller of the Currency. Annual Report to the Second Session of the Forty-eighth Congress of the United States, December 1, 1884. 8vo. pamphlet. Washington: 1884. H. W. Cannon, Comptroller.

Holley, Myron, Life of, etc. 12mo. Boston: 1882. Portrait. Elizur Wright.

New Brunswick. Report on the Agricultural Capabilities of the Province. By J. F. W. Johnson, F. R. S., S. L. & E., etc., etc. 8vo. pamphlet. Fredericton: 1850. Mrs. Isabella James.

Handbook of Virginia. By the Commissioner of Agriculture. 8vo. pamphlet, with map. Fourth edition. Richmond: 1885. Randolph Harrison, Commissioner.

United States Consular Reports. On the Commerce, Manufactures, etc. of the Consular Districts, Nos. 46–57. Also, Reports on the Cholera in Europe in 1884; on the Trade Guilds of Europe, and on Labor in Foreign Countries. Published by the Department of State, according to Act of Congress. 15 pamphlets and 3 volumes 8vo. Washington: 1884, 1885. The Secretary of State.

Periodicals Purchased.

English. — Gardeners' Chronicle.
Gardeners' Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Gardening Illustrated.
Curtis's Botanical Magazine.
Journal of Botany.
Forestry.
Woods and Forests.

FRENCH. — Revue Horticole.
Revue des Eaux et Forêts.
Journal des Roses.
BELGIAN. — Illustration Horticole.
Belgique Horticole.
Revue de l'Horticulture, Belge et Étrangère.
GERMAN. — Botanische Zeitung.
Gartenflora.
AMERICAN.—Country Gentleman.
American Naturalist.

PERIODICALS RECEIVED IN EXCHANGE.

Gardener's Monthly.
Canadian Horticulturist.
Ladies' Floral Cabinet.
American Garden.
Vick's Illustrated Monthly Magazine.
Michigan Horticulturist.
American Florist.
Orchard and Garden.
Fruit Recorder.
Green's Fruit Grower.
Seed Time and Harvest.
Botanical Gazette.
Journal of Mycology.
West American Scientist.
Maine Farmer.
The Home Farm.
Mirror and Farmer.
New England Farmer.
Massachusetts Ploughman.
American Cultivator.
New England Homestead.
Our Country Home.
American Agriculturist.
Rural New Yorker.
The Husbandman.
American Rural Home.
The Farm Journal.
Maryland Farmer.
Florida Dispatch.
Prairie Farmer.

The Industrialist.
Pacific Rural.
Boston Daily Advertiser.
Boston Morning Journal.
Boston Post.
Boston Daily Globe.
Boston Evening Transcript.
Boston Daily Evening Traveller.
The New York Weekly World.
The Cottage Hearth.

REPORT

OF THE

SECRETARY AND LIBRARIAN,

FOR THE YEAR 1885.

In presenting to the Society this annual report as Secretary, I rely upon the knowledge and daily observation of its active members as a supplement to the following suggestions, concerning the extent and character of the duties attaching to the office as matters of ordinary routine.

It will not be unreasonable if we assume that, in general, the Secretary's routine is necessarily extended in like proportion with the broadening scope, and increasing variety, of the work carried on in all departments,—otherwise the neglect would make itself promptly known in various ways, that seem thus far to have been fairly well avoided.

The Constitution and By Laws set forth the outlines, and also some specific features, of duties to be performed in matters of record, correspondence, and notification, and in the audit and examination of bills contracted. No essential matters of this description, it is believed, have suffered from neglect during the year, or now remain seriously in arrears. Yet it is to be said that certain matters, which have not come into existence all at once, but have grown up by degrees, and now appear in the character of important requirements, are at present unfinished, though in a hopeful stage of advancement.

Of these, one which may be mentioned relates to the List of Annual and Life Members; forming a part of the Society's annual publications. The Secretary assumes a duty not defined or directly suggested by the By Laws (unless under his general responsibility for whatever is published), in pursuing from time to

time, as opportunity offers, the very necessary task of revising and correcting this list; which constitutes a very important portion of the Society's records. From the necessity of his situation, having need to communicate, as occasion may require, with individual members, he finds that all changes of residence and discontinuance of membership by death or otherwise, are matters to which his attention ought to be given.

Heretofore, as far as possible — but without especially devoting time to it, and under urgent call at all times for other needed work, — he has prosecuted inquiries on all convenient occasions; and supplied the revisions ascertained to be needed. Recently this work has engaged his attention more especially, as a matter of growing urgency.

It had long been suspected that the List of Members stood in need of revision, but on systematically undertaking it, the need was found much greater than had been previously supposed. Its necessity may be judged of from the fact that there are now on the list the names of about fifty members, who, when last heard from, were residents of Boston, but whose names are not now to be found in the Boston Directory. On the other hand, the Directory contains the names of as many more, who when last heard from were not residents of this city; raising the question whether such members have removed to Boston, but not deciding it, since there may have been two persons of the same name. A request is every year printed, at the head of the list of members, for prompt information in regard to change of residence or any inaccuracies; but this request is seldom heeded. The present Treasurer, as well as his predecessor, has kept careful watch over the list of members, but notwithstanding all these efforts it is found that a large number of changes have been made, which have not come to the knowledge of either the Treasurer or the Secretary.

Inasmuch as the facts in question are often difficult to ascertain decisively, and since experience has shown that, even under the strongest probabilities, it is hazardous to change the record until direct and positive evidence is secured from those having a personal knowledge, the Secretary particularly invites the coöperation of members in this work. Almost every one might furnish more or less aid in collecting the required information, and in view of

coming publications, in which the list will reappear, it is earnestly requested that all members will carefully examine it and report to the Secretary such changes as may be found necessary.

Notice has been given, by circulars addressed to all the members not known to be supplied, that copies of the official HISTORY OF THE SOCIETY, published in 1880, may be had by any desiring them. It was in addressing these circulars that the urgent necessity for a revision of the list became apparent. The purely incidental way in which this task of reviewing the record of membership has arisen and grown into a pressing duty of considerable magnitude is very suggestive. It is typical of many other demands upon the Secretary, created by a variety of other subjects.

These it would be tedious to enlarge upon. They originate from the character of his office as the natural executive channel for a variety of matters arising in the ordinary working of the Society, or in the maintenance of its relations to the public, and to sister societies. To state them in a manner at once concise and comprehensive is probably impossible; they are here barely alluded to with a confident belief that, to all who give the matter reflection, a further discussion would be superfluous.

The literary work, like the routine business, can scarcely be detailed — only outlined; but being put into a visible form, it may be said, in a manner, to speak for itself.

It is a gratifying circumstance that, owing to the valuable aid opportunely extended early in the year, in providing the services of an able general assistant in the Secretary's office, employed in this and other departments of its manifold duties, the Society's TRANSACTIONS and other publications are fully brought out up to date.

It is a further gratification to remark the fact,— due, of course, chiefly to the intrinsic value of the essays and discussions, but perhaps also in some important degree to the care bestowed in their preparation for the press,— that there has been an evidently increased consideration accorded to them, both among members of the Society and the general public. Extracts, in greater number and at greater length than in previous years, have been republished in the columns of leading journals both at home and abroad.

In the last report of the Secretary, mention was made of some inquiries as to the aid afforded by various States for the advance-

ment of horticulture; and some of the results of these inquiries were given. At the time these researches were made, the Report for 1884 of the California State Board of Horticulture had not been received; but it has since been added to our library, and the Secretary of the Board has called attention to the fact that the amount appropriated by the State of California for the promotion of horticulture is larger than in any other state. It seems therefore only just to add in this place, to the statement made last year, that in each of the years 1883 and 1884 California's appropriation for this purpose was $5,000, and that for the present year it is $10,000; while besides this the state appropriates $15,000 for the Viticultural Board, $5,000 for experimental and scientific work in regard to viticulture, and $2,500 for the State Forestry Commission.

In addition to matters already treated of, the Secretary is charged with the duties of Librarian, which he performs under the immediate direction of the Library Committee. In the report of that Committee, accordingly, may be found a more complete treatment than here, of all matters involved in the use, present condition, plans of enlargement, and future prospects of this most valuable and distinguishing possession of our honored Society. Such is the rank which must be accorded to it in view of the present extent and quality of its peculiar literary treasures, its resources by way of endowment, and the estimation placed upon it by those devoted to studies promotive of the special objects of our Society.

Statistics of circulation are out of the argument as regards a library whose maintenance insures the preservation of the best fruits of advanced research, in a repository accessible to scholars and students. As has been well said by competent judges, treating of a "library for advanced students, or for persons making researches of a learned nature" — "the benefit reaped from it by the community cannot be reckoned by any method of statistics. It is by means of such collections as this that some of the greatest benefactors of the public are enabled to prosecute their researches and to do their work."

Decidedly the most valuable part of our library consists of books by no means adapted or intended for general circulation. We supply a fair, and, on the whole, a nearly indispensable part

of the current reading of our best practical horticulturists. We divide that field, as a matter of course, with agricultural and horticultural publications which members procure, for home reading, in other ways. But the books by the possession of which this Society enjoys an enviable prestige, and which make its library the prized resort of scholars in, and lovers of, the ever advancing art of horticulture, are of a class whose utility is to be measured, if at all, by another standard than that of more or less extensive circulation.

For many years the need of additional accommodation has been pressed upon the attention of the Society, in the reports both of the Library Committee and the Librarian. An impression prevails, in the minds of some, that the crowded state of the bookcases causes inconvenience, and adds to the labors of the Librarian, only when a book is wanted for use; and it seems desirable to correct this not unnatural misapprehension. Not alone when a book is called for, but daily and continually there is need, for every volume, of a place where the Librarian can swiftly and surely lay hand upon it. However infrequently consulted, all books kept as the property of the Society should be so shelved as to be familiar to him, both as to contents and position,—to the end that each new book arriving may promptly take its right place, in right relations to the rest.

Failing this, classification is simply impossible, and disorder and perplexity must increase in a constantly advancing ratio. Let him do his best and struggle his hardest, the odds are against him and are daily growing greater; his most strenuous endeavors cannot meet and overcome the confusion inevitably entailed by over-crowded shelves, and compulsory stowage in widely separated and inaccessible places.

ROBERT MANNING,

Secretary and Librarian.

TREASURER'S REPORT,

FOR THE YEAR 1885.

RECEIPTS.

Cash on hand, as per last report,		$6,795 78
Rent of Halls,		6,404 61
Rent of Stores,		12,825 36
Admissions and Assessments,		1,074 00
Library — Sale of Book,		15 00
Sale of History,		94 50
Mount Auburn Cemetery,		2,713 53
Annual Exhibitions,	$3,540 05	
Less Expenses,	1,009 74	
		2,530 31
Estate of Benjamin B. Davis,		500 00
		$32,953 09

EXPENDITURES.

Labor,		$1,246 79
Salaries,		2,825 00
Incidentals,		217 79
Interest Paid,	$2,550 00	
Less amount received,	709 19	
		1,840 81
Heating and Water (less paid by Tenants),		301 63
Taxes,		1,536 52
Repairs on Building,		636 08
Lighting,		733 90
Furniture and Fixtures,		59 68
Prizes,		3,500 60
Committee of Arrangements,		394 80
Stationery, Postage, and Printing,		1,449 34
Stickney Fund,		700 02
Carried forward,		$15,442 96

Brought forward,	$15,442 96	
Library,	315 00	
Card Catalogue,	100 00	
Sinking Fund,	11,233 56	
Garden Committee,	55 96	
Committee on Publication and Discussion,	120 00	
Benjamin B. Davis Fund,	583 00	
Insurance,	815 00	
Forestry Congress,	13 70	
Cash for balance to new account for 1886,	4,273 91	
		$32,953 09

ASSETS.

Real Estate, Furniture, and Exhibition Ware,		$256,585 56
Library, last year,	$23,646 12	
Added this year,	1,000 00	
		$24,646 12
H. H. Hunnewell Rhododendron Prize Bonds, viz.:		
1 Bond C. B. & Q. R. R. for $1,000 and 1 for $500,		1,500 00
Sinking Fund Bonds, viz.:		
13 Bonds Burl. & Miss. R. R. in Neb. for $1,000 each,		11,656 81
7 Bonds C. B. & Q. R. R. for $1,000 each,		6,476 75
Benjamin B. Davis Grape Prize Bond, viz.:		
1 Bond Illinois Grand Trunk R. R. for $500,		583 00
Stereotype Plates, and Copies of History,		299 50
Cash on hand December 31, 1885,		4,273 91
		$306,021 65

LIABILITIES.

Mortgage Debt, bearing interest at 4½ per cent per annum, due October 1, 1888,	$60,000 00	
Loan, without Interest, payable to Harvard College in 1899,	12,000 00	
		72,000 00
Surplus,		$234,021 65

MEMBERS.

Number of Life Members, by last printed List,		609	
Added during the year,	16		
Commuted from Annual,	3		
	—	19	
		—	628
Deceased during the year or now first reported,			39
			589
Number of Annual Members, by last printed List,	279		
Added during the year,	14		
	—	293	
Deceased during the year or now first reported,	7		
Discontinued,	15		
Commuted,	3		
	—	25	
		—	268
Total Membership,			857

INCOME FROM MEMBERSHIP.

15	Life Members,	$450 00	
14	Annual Members,	140 00	
202	Assessments,	404 00	
4	Commutations (including 1 deferred from 1884),	80 00	
		———	$1,074 00

The Finance Committee, having audited the accounts of the undersigned, have made and subscribed to, on a book kept for that purpose, the following report:—

The Massachusetts Horticultural Society

In account with GEORGE W. FOWLE, *Treasurer*,

Credit:—

By balance in Treasury, December 31, 1884,	$6,795 78	
" total income during the year 1885,	26,157 31	
	———	$32,953 09

Contra Debit:—		
To cash paid out during the year 1885,	$28,679 18	
" balance to new account, . .	4,273 91	
		$32,953 09

We have examined the above account and find it correct, and the balance of cash on hand, forty-two hundred and seventy-three $\frac{91}{100}$ dollars.

(Signed) H. H. HUNNEWELL,
FREDERICK L. AMES,
H. P. WALCOTT,
Finance Committee.

BOSTON, Feb. 5, 1886.

The sum of $11,233 of the surplus funds has been invested in railroad bonds, to increase the Sinking Fund for the reduction of the mortgage debt, the Fund now amounting to $18,133. The sum of $500, received from the estate of Benjamin B. Davis, has also been invested in a railroad bond.

The amount of interest paid by the Society has been decreased from $3,860, paid in 1882, to $1,840 in 1885.

The receipts from the Halls during the year have been less than in previous years,— partially owing to reduction of rents in competition with other halls.

The receipts from the Annual Exhibitions show an increased income, but the accommodations of the halls are insufficient for the future enlargement of these exhibitions.

GEORGE W. FOWLE,
Treasurer.

BOSTON, Feb. 5, 1886.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* Cr.

For Sales and Improvements within the Cemetery for the year ending December 31, 1885.

To cost of filling up and improving land at Mt. Auburn for the year ending December 31, 1885; the Massachusetts Horticultural Society being charged with their proportion of the same :—		By Sales in January,	$489 50
Vesper Avenue,	$1,529 87	" " " February,	149 75
Glen Avenue,	1,911 88	" " " March,	540 62
Crystal to Birch Avenues,	662 38	" " " April,	1,830 00
	$4,104 13	" " " May,	2,123 75
		" " " June,	3,858 37
		" " " July,	1,270 00
		" " " August,	374 75
		" " " September,	430 00
		" " " October,	1,228 75
		" " " November,	3,384 75
		" " " December,	200 00
			$15,880 24
		Net amount received from Receiving Tomb,	493 00
			$16,373 24
		Less graves repurchased,	15 00
			$16,358 24
		Deduct for Annual Expenses,	1,400 00
			$14,958 24
One quarter of $4,104.13 is,	$1,026 03		
Balance due Massachusetts Horticultural Society,	2,713 53		
	$3,739 56	Mass. Horticultural Society's one-quarter part of $14,958.24 is,	$3,739 56

E. & O. E.

December 31, 1885.

H. B. MACKINTOSH, *Treasurer.*

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, *Dr.*

For one-fourth part of the following expenditures for grading new lands for sale during the year 1885 :—

Vesper Avenue.

507½ days, men,	$1,014 50	
147½ " man and horse,	515 37	
		$1,529 87

Glen Avenue.

581 days, men,	$1,162 00	
214½ " man and horse,	749 88	
		$1,911 88

Crystal to Birch Avenues.

225½ days, men,	$451 50	
60½ " man and horse,	210 88	
		$662 38
		$4,104 13
One-fourth part of $4,104.13 is,		$1,026 03

J. W. LOVERING,
Superintendent.

MOUNT AUBURN, Dec. 31, 1885.

I certify the foregoing to be a true copy of improvements for the year 1885, rendered by the Superintendent.

H. B. MACKINTOSH,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1886.

President.

HENRY P. WALCOTT, of Cambridge.

Vice-Presidents.

JOHN CUMMINGS, of Woburn. CHARLES H. B. BRECK, of Brighton.
BENJAMIN G. SMITH, of Cambridge. FREDERICK L. AMES, of North Easton.

Treasurer and Superintendent of the Building.

GEORGE W. FOWLE, of Boston.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees.

Executive.

THE PRESIDENT, HENRY P. WALCOTT, CHAIRMAN.
THE CHAIRMAN OF FINANCE COMMITTEE, H. H. HUNNEWELL; MARSHALL P. WILDER, WILLIAM C. STRONG, F. L. AMES, CHARLES H. B. BRECK, HENRY WELD FULLER, CHARLES S. SARGENT, WILLIAM H. SPOONER.

*Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston.

Finance.

H. HOLLIS HUNNEWELL, CHAIRMAN.

HENRY P. WALCOTT. F. L. AMES.

Publication and Discussion.

O. B. HADWEN, CHAIRMAN.

FRANCIS H. APPLETON. WILLIAM H. HUNT.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;* C. M. ATKINSON, EDWARD L. BEARD, JACKSON DAWSON.

Library.

WILLIAM E. ENDICOTT, CHAIRMAN.

THE PROFESSOR OF BOTANY AND VEGETABLE PHYSIOLOGY AND THE PROFESSOR OF ENTOMOLOGY, *EX OFFICIIS;*

J. D. W. FRENCH. NATHANIEL T. KIDDER.

FRANCIS H. APPLETON. GEORGE W. HUMPHREY.

Gardens.

JOHN G. BARKER, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, AND VEGETABLES, *EX OFFICIIS:*

CHARLES W. ROSS, BENJAMIN G. SMITH, HENRY W. WILSON.

Fruit.

E. W. WOOD, CHAIRMAN.

BENJAMIN G. SMITH.	J. W. MANNING.	WARREN FENNO.
CHARLES F. CURTIS.	O. B. HADWEN.	E. P. RICHARDSON.

Plants and Flowers.

JOSEPH H. WOODFORD, CHAIRMAN.

F. L. HARRIS.	EDWIN FEWKES.	WARREN H. MANNING.
DAVID ALLAN.	DENYS ZIRNGIEBEL.	ROBERT T. JACKSON.

Vegetables.

CHARLES N. BRACKETT, CHAIRMAN.

SAMUEL HARTWELL.	WARREN HEUSTIS.	JAMES COMLEY.
CEPHAS H. BRACKETT.	GEORGE HILL.	P. G. HANSON

Committee of Arrangements.

EDWARD L. BEARD, CHAIRMAN

CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;*

WARREN HEUSTIS. CHARLES L. FOWLE.

MEMBERS FOR LIFE.

Change of residence, or any inaccuracies, should be promptly reported to the Secretary.

Adams, George E., Medford.
Albro, Charles, Taunton.
Alger, R. F., Becket.
Allan, David, Watertown.
Ames, Frank M., Canton.
Ames, Frederick L., North Easton.
Ames, George, Boston.
Ames, Preston Adams, Hingham.
Amory, Charles, Boston.
Amory, Frederick, Boston.
Anderson, Alexander, Hingham.
Andrews, Charles L., Milton.
Andrews, Frank W., Boston.
Andros, Milton, Brookline.
Appleton, Edward, Reading.
Appleton, Francis H., Peabody.
Appleton, William S., Boston.
Atkins, Elisha, Boston.
Avery, Edward, Boston.
Ayling, Isaac, Waltham.

Bacon, George, Brookline.
Bailey, Edwin C., Concord, N. H.
Baker, William E., Boston.
Bancroft, John C., Boston.
Banfield, Francis L., Boston.
Barnard, James M., Malden.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
Barnes, William H., Boston.
Barney, Levi C., Boston.
Barratt, James, Cambridgeport.
Barrett, Edwin S., Concord.
Barrows, Thomas, Dedham.
Bartlett, Edmund, Newburyport.
Bates, Amos, Hingham.
Bates, Caleb, Kingston.
Bayley, John P., Boston.
Beal, Alexander, Dorchester.
Beckford, Daniel R., Jr., Dedham.
Bell, Joseph H., Quincy.
Bemis, Emery, Cambridge.
Berry, James, Brookline.
Bickford, Weare D., Newtonville.
Birchard, Charles, Framingham.
Black, James W., Cambridge.
Blagg, Samuel, Newbern, N. C.
Blake, Arthur W., Brookline.
Blakemore, John E., Roslindale.
Blanchard, John W., Dorchester.
Blaney, Henry, Boston.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Springfield.
Bocher, Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bond, George W., West Roxbury.
Borland, John N., New London, Ct.
Botume, John, Wyoming.
Bouvé, Thomas T., Boston.
Bowditch, Azell C., Somerville.
Bowditch, J. Ingersoll, Jamaica Plain.
Bowditch, William E., Roxbury.
Bowker, William H., West Newton.
Brackett, Cephas H., Brighton.
Brackett, Charles N., Newton.
Bradish, Levi J., Boston.
Bragg, Samuel A. B., Dorchester.
Breed, Henry A., Lynn.
Bresee, Albert, Hubbardton, Vt.
Brewer, John Reed, Boston.
Brewer, Otis, Jamaica Plain.
Brigham, William T., Boston.
Brimmer, Martin, Boston.

Brintnall, Benjamin, Charlestown.
Brooks, Francis, West Medford.
Brown, Alfred S., Jamaica Plain.
Brown, Charles E., Yarmouth, N.S.
Brown, Edward, J., Weston.
Brown, G. Barnard, Boston.
Brown, George Bruce, Framingham.
Brown, Jacob, Woburn.
Brownell, E. S., Essex Junction, Vt.
Bruce, Nathaniel F., Stoneham.
Bullard, John R., Dedham.
Bullard, William S., Boston.
Burnett, Joseph, Southborough.
Burnham, Thomas O. H. P., Boston.
Burr, Fearing, Hingham.
Burr, Matthew H., Hingham.
Buswell, Edwin W., New York, N.Y.
Buswell, Frank E., New York, N.Y.
Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Butterfield, William P., East Lexington.

Cadness, John, Flushing, N.Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carruth, Charles, Boston.
Carter, Miss Sabra, Wilmington.
Cartwright, George, Dedham.
Chadbourne, Marshall W., Watertown.
Chamberlain, Chauncey W., Boston.
Chapin, Nathaniel G., Brookline.
Chapman, Edward, South Framingham.
Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Boston.
Chase, Hezekiah S., Boston.
Chase, William M., Baltimore, Md.
Cheney, Benjamin P., Boston.
Child, Francis J., Cambridge.
Child, William C., Medford.
Childs, Francis, Charlestown.
Childs, Nathaniel R., Boston.
Choate, Charles F., Cambridge.
Claflin, Henry, Newton.
Claflin, William, Newton.
Clapp, Edward B., Dorchester.
Clapp, E. W., Walpole.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, Orus, Worcester.
Clark, William S., Amherst.
Clark, W. L., Neponset.
Clarke, Miss Cora H., Jamaica Plain.
Clay, Henry, Dorchester.
Cleary, Lawrence, West Roxbury.
Clement, Asa, Dracut.
Cleveland, Ira, Dedham.
Cobb, Albert A., Brookline.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, Lincoln.
Coffin, G. Winthrop, West Roxbury.
Coffin, William E., Dorchester.
Converse, Elisha S., Malden.
Converse, Parker L., Woburn.
Coolidge, Joshua, Watertown.
Copeland, Franklin, West Dedham.
Cox, George P., Malden.
Coy, Samuel I., Boston.
Crocker, George O., New Bedford.
Crocker, Uriel, Boston.
Crosby, Josiah, Arlington.
Crowell, Philander, Chelsea.
Crowell, Randall H., Chelsea.
Cummings, John, Woburn.
Curtis, Charles F., Jamaica Plain.
Curtis, George S., Jamaica Plain.
Cushing, Robert M., Boston.

Daggett, Henry C., Boston.
Damon, Samuel G., Arlington.
Dana, Charles B., Brookline.
Darling, Charles K., Boston.
Davenport, Edward, Dorchester.
Davenport, George E , Medford.
Davenport, Henry, Boston.

Davis, Curtis, Cambridgeport.
Dawson, Jackson, Forest Hills.
Deblois, Stephen G., Boston.
Dee, Thomas W., Mount Auburn.
Denny, Clarence H., Boston.
Denny, R. S., Dorchester.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dickerman, George H., Somerville.
Dike, Charles C., Stoneham.
Dinsmore, William B., New York, N. Y.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Durant, William, Boston.
Durfee, Mrs. F. B., Fall River.
Durfee, George B., Fall River.
Dutcher, F. J., Hopedale.

Eaton, Horace, Quincy.
Eldridge, Azariah, Yarmouthport.
Eldridge, E. H., Roxbury.
Ellicott, Joseph P., Boston.
Endicott, William E., Canton.
Eustis, William C., Hyde Park.
Everett, Otis, Boston.
Everett, William, Dorchester.

Fairchild, Charles, Belmont.
Falconer, William, Glencove, N. Y.
Farlow, John S., Newton.
Farlow, Lewis H., Newton.
Farquhar, Robert, Boston.
Faxon, John, Quincy.
Fay, Mrs. Rebekah L., Chelsea.
Fenno, J. Brooks, Boston.
Fewkes, Arthur H., Newton Highlands.
Fewkes, Edwin, Newton Highlands.
Fillebrown, John, Arlington.
Fisher, David, Newport, R. I.
Fisher, James, San Diego, Cal.
Fisher, Warren, Boston.
Flagg, Augustus, Boston.
Fleming, Edwin, West Newton..
Fletcher, George V., Belmont.
Fletcher, John W., Chelsea.
Fletcher, J. Henry, Belmont.
Flint, Charles L., Boston.
Flint, David B., Watertown.
Flynt, William N., Monson.
Foster, Francis C., Cambridge.
Foster, John H , Boston.
Fottler, John, Jr., Dorchester.
Fowle, William B., Auburndale.
Freeman, Abraham, Dorchester.
French, Jonathan, Boston.
French, J. D. Williams, Boston.
Fuller, Henry Weld, Roxbury.

Galvin, John, West Roxbury.
Gardner, Henry N., Belmont.
Gardner, John L., Brookline.
Gibbs, Wolcott, Cambridge.
Gillard, William, Boston.
Gilmore, E. W. North Easton.
Gilson, F. Howard, Reading.
Glover, Albert, Boston.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Mrs. Mary T., Newton.
Goodell, L. W., Amherst.
Gorham, James L., Jamaica Plain.
Gould, Francis, Arlington.
Gould, Samuel, Boston.
Gray, James, Wellesley.
Gregory, James J. H., Marblehead.
Greig, George, Newton.
Groom, Thomas, Dorchester.
Grundel, Hermann, Dorchester.
Guild, J. Anson, Brookline.

Hadwen, Obadiah B., Worcester.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, George R., Fort George, Fla.
Hall, John R., Roxbury.
Hall, Lewis, Cambridge.
Hall, Stephen A., Revere.
Hall, William F., Brookline.
Halliday, William H., South Boston.

Hammond, Gardner G., Boston.
Hammond, Samuel, Boston.
Hanson, P. G., Woburn.
Harding, Charles L., Cambridge.
Harding, George W., Boston.
Harding, Lewis B., Boston.
Harding, William C., Stamford, Ct.
Hardy, F. D., Jr., Cambridgeport.
Harrington, Leonard B., Salem.
Harris, Charles, Cambridge.
Hart, William T., Boston.
Hastings, Levi W., Brookline.
Hathaway, Seth W., Marblehead.
Haughton, James, Boston.
Haven, Alfred W., Portsmouth, N.H.
Hayes, Daniel F., Exeter, N. H.
Hayes, Francis B., Lexington.
Hazeltine, Hazen, Boston.
Head, Charles D., Brookline.
Henshaw, Joseph P. B., Boston.
Heywood, George, Concord.
Hilbourn, A. J., Chelsea.
Hill, George, Arlington.
Hill, John, Stoneham.
Hilton, William, Boston.
Hitchings, E. H., Boston.
Hoar, Samuel, Concord.
Hodgkins, John E., Chelsea.
Hollis, George M., Grantville.
Hollis, John W., Allston.
Holt, Mrs. Stephen A., Winchester.
Hooper, Robert C., Boston.
Hooper, Thomas, Bridgewater.
Horner, Mrs. Charlotte N. S., Georgetown.
Hovey, Charles H., Cambridgeport.
Hovey, Charles M., Cambridgeport.
Hovey, John C., Cambridgeport.
Hovey, Stillman S., Woburn.
Howe, George, Boston.
Hubbard, Charles T., Weston.
Hubbard, Gardner G., Cambridge.
Hubbard, James C., Everett.
Humphrey, F. J., Dorchester.
Humphrey, George W., Dedham.
Hunneman, Joseph H., Boston.
Hunnewell, Arthur, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Franklin, Boston.
Hunt, Moses, Charlestown.
Hunt, William H., Concord.
Hyde, James F. C., Newton.

Inches, Herman B., Boston.

Jackson, Abraham, Boston.
Jackson, Robert T., Dorchester.
Janvrin, William S., Revere.
Jeffries, John, Boston.
Jenks, Charles W., Boston.
Joyce, Mrs. E. S., Medford.

Kakas, Edward, Medford.
Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
Kendall, Joseph R., Oakland, Cal.
Kendrick, Mrs. H. P., Allston.
Kennard, Charles W., Boston.
Kennedy, George G., Milton.
Kent, John, Charlestown.
Keyes, E. W., Denver, Col.
Keyes, George, Concord.
Kidder, Henry P., Boston.
Kidder, Nathaniel T., Boston.
Kimball, A. P., Boston.
King, Franklin, Dorchester.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, John M., Boston.
Kinsley, Lyman, Cambridgeport.
Kittredge, E. A., Boston.

Lamb, Thomas, Boston.
Lancaster, Charles B., Newton.
Lane, John, East Bridgewater.
Lawrence, Amos A., Boston.
Lawrence, James, Boston.
Lawrence, John, Boston.
Lee, Henry, Boston.
Leeson, Joseph R., Newton Centre.
Lemme, Frederick, Arlington.
Leuchars, Robert B., Boston.

Lewis, A. S., Framingham.
Lewis, William G., Framingham.
Lincoln, George, Hingham.
Locke, William H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, G. Henry, Boston.
Loftus, John P., North Easton.
Loomis, Jason B., Boston.
Lord, George C., Newton.
Loring, Caleb W., Beverly Farms.
Loring, George B., Salem.
Lovett, George L., West Newton.
Low, Ariel, Roxbury.
Lowder, John, Watertown.
Lowell, Augustus, Boston.
Luke, Elijah H., Cambridgeport.
Lumb, William. Boston.
Lunt, Charles H., Jamaica Plain.
Lyman, Theodore, Brookline.
Lyon, Henry, Charlestown.

Mahoney, John, Boston.
Mann, James F., Ipswich.
Mann, Jonathan, Milton.
Manning, Jacob W., Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Reading.
Marshall, Frederick, Everett.
Martin, Darius A., Chelsea.
Martin, John S., Roxbury.
Matthews, Nathan, Boston.
McCarty, Timothy, Providence, R.I.
McClure, John, Revere.
Melvin, James C., West Newton.
Merriam, Herbert, Weston.
Merriam, M. H., Lexington.
Merrifield, William T., Worcester.
Metivier, James, Cambridge.
Minton, James, Boston.
Moore, John B., Concord.
Moore, John H., Concord.
Morrill, Joseph, Jr., Roxbury.
Morse, Samuel F., Boston.
Morse, William A., Boston.
Motley, Thomas, Forest Hills.
Mudge, George A., Portsmouth, N. H.
Munroe, Otis, Boston.

Needham, Daniel, Groton.
Nevins, David, Framingham.
Newhall, George, Dorchester.
Newman, J. R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, Albert W., Marion.
Nickerson, George A., Dedham.
Norton, Charles W., Allston.
Nourse, Benjamin F., Boston.
Nourse, Benjamin F., Cambridgeport.

Oakman, Hiram A., North Marshfield.
Osgood, James Ripley, Boston.
Oxnard, George D., Boston.

Packer, Charles H., Boston.
Page, Thomas, Boston.
Paige, Clifton H., Boston.
Parker, Augustus, Roxbury.
Parker, Mrs. Mary, Wakefield.
Parkman, Francis, Jamaica Plain.
Partridge, Henry, Dunkirk, N.Y.
Partridge, Horace, Cambridge.
Paul, Alfred W., Dighton.
Peabody, John E., Salem.
Pearce, John, West Roxbury.
Peck, O. H., Denver, Col.
Peck, W. G., Arlington.
Peirce, Silas, Boston.
Penniman, A. P., Waltham.
Perkins, Augustus T., Boston.
Perkins, Edward N., Jamaica Plain.
Perkins, William P., Wayland.
Perry, George W., Malden.
Philbrick, William D., Newton Centre.
Pierce, Dean, Brookline.
Pierce, George W., Everett.
Pierce, Henry L., Boston.

Pierce, Samuel B., Dorchester.
Poole, Benjamin C., Chelsea.
Poor, John R., Somerville.
Potter, Joseph S., Arlington.
Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Pratt, William, Winchester.
Pray, Mark W., Beachmont.
Prescott, Eben C., Boston.
Prescott, William G., Boston.
Prescott, William G., Quincy.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, Thomas P., West Roxbury.
Prouty, Gardner, Littleton.
Pulsifer, Royal M., Auburndale.
Putnam, Joshua H., Brookline.

Ramsay, A. H., Cambridge.
Rand, Miss E. L., Newton Highlands.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Ray, James P., Franklin.
Ray, Joseph G., Franklin.
Reed, George W., Boston.
Richards, John J., Boston.
Richardson, Charles E., Cambridgeport.
Richardson, George C., Boston.
Rinn, J. Ph., Boston.
Robbins, I. Gilbert, Dorchester.
Robbins, Nathan, Arlington.
Robeson, William R., Boston.
Robinson, John, Salem.
Robinson, Joseph B., Allston.
Rogers, John H., Boston.
Ross, Henry, Newtonville.
Ross, M. Denman, Forest Hills.
Ross, Waldo O., Boston.
Ruddick, Dr. W. H., South Boston.
Russell, George, Woburn.
Russell, John E., Leicester.
Russell, Walter, Arlington.

Sampson, George R., New York, N.Y.
Sanborn, Amos C., Cambridgeport.
Sanford, Oliver S., Hyde Park.
Sargent, Charles S., Brookline.
Sargent, John O., Lenox Furnace.
Saville, Richard L., Brookline.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Charlestown.
Scott, Charles, Newton.
Scudder, Charles W., Brookline.
Sears, J. Montgomery, Boston.
Seaver, Nathaniel, East Boston.
Seaver, Robert, Jamaica Plain,
Shaw, Christopher C., Milford, N.H.
Shaw, S. P., Cambridge.
Sheldon, Oliver S., Milton.
Shimmin, Charles F., Boston.
Shorey, John L., Lynn.
Skinner, Francis, Boston.
Smith, Benjamin G., Cambridge.
Smith, Calvin W., Grantville.
Smith, Charles H., Jamaica Plain.
Smith, Chauncey, Cambridge.
Smith, Edward N., San Francisco.
Smith, George O., Boston.
Smith, James H., Needham.
Smith, Whitman B., Roxbury.
Snow, Eben, Cambridge.
Snow, Miss Salome H., Brunswick, Me.
Sparhawk, Edward C., Brighton.
Spaulding, Edward, Newton.
Spaulding, Mahlon D., Boston.
Speare, Alden, Newton Centre.
Spencer, Alfred W., Boston.
Springall, George, Malden.
Springer, John, Sterling.
Stetson, Nahum, Bridgewater.
Stewart, William J., Winchester.
Stickney, Rufus B., Somerville.
Stimpson, George, New York, N.Y.
Stimpson, H. H., Cambridge.
Stone, Amos, Everett.
Stone, George F., Newton.
Stone, Phineas J., Charlestown.
Story, E. Augustus, Brighton.

Strong, William C., Newton Highlands.
Sturgis, John H., Brookline.
Sturgis, Russell, Jr., Boston.
Sturtevant, E. Lewis, Geneva, N.Y.
Surette, Louis A., Concord.
Swain, Charles D., Roxbury.

Taft, John B., Cambridge.
Tappan, Charles, Boston.
Taylor, Horace B., Boston.
Thayer, Henry, North Cambridge.
Thurlow, Thomas C., Newburyport.
Tidd, Marshall M., Woburn.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss Harriet S., Boston.
Torrey, Everett, Charlestown.
Turner, John M., Dorchester.
Turner, Roswell W., Boston.
Turner, Royal W., Randolph.

Underwood, Guy C., Roxbury.
Underwood, William J., Belmont.

Vass, William J., Brookline.
Vinal, Miss Mary L., Somerville.
Vose, Benjamin C., Hyde Park.

Wainwright, William L., Braintree.
Wakefield, E. H., Cambridge.
Walcott, Edward, Pawtucket, R. I.
Walcott, Henry P., Cambridge.
Wales, George O., Braintree.
Walker, Edward C. R., Dedham.
Walker, Samuel A., Dedham.
Walker, Theophilus W., Waltham.
Walley, Mrs. W. P., Boston.
Ward, John, Newton.
Wardwell, William H., Newton Centre.
Ware, Benjamin P., Beach Bluff.
Warren, George W., Boston.
Washburn, Andrew, Hyde Park.
Wason, Elbridge, Brookline.
Waters, Edwin F., Newton Centre.
Waters, George F., Boston.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Weld, Aaron D., West Roxbury.
Weld, George W., Newport, R. I.
Weld, Dr. Moses W., Boston.
Weld, Richard H., Boston.
Weld, William G., Boston.
West, Mrs. Maria L., Neponset.
Weston, Leonard W., Lincoln.
Weston, Seth, Revere.
Wheelwright, A. C., Boston.
Whipple, John A., Boston.
Whitcomb, William B., Medford.
White, Benjamin C., Boston.
White, Edward A., Boston.
White, Francis A., Brookline.
Whitely, Edward, Cambridge.
Whiting, Nathaniel, Brookline.
Whittle, George W., Somerville.
Whytal, Thomas G., New York, N.Y.
Wilbur, George B., West Newton.
Wilcutt, Levi L., West Roxbury.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Wilder, Marshall P., Dorchester.
Willard, E. W., Newport, R. I.
Williams, Aaron D., Boston.
Williams, Benjamin R., Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Boston.
Wilson, Henry W., Boston.
Wilson, William Power, Boston.
Woerd, Charles V., Waltham.
Woerd, Charles V., Jr., Waltham.
Wood, Luke H., Marlborough.
Wood, R. W., Jamaica Plain.
Wood, William K., West Newton.
Woods, Henry, Boston.
Woodward, Royal, Brookline.
Wright, George C., West Acton.
Wrisley, Frank, New York, N. Y.

ANNUAL MEMBERS.

Abbot, Samuel L., Boston.
Allen, Andrew F., Arlington.
Allen, Calvin, Roxbury.
Allen, C. L., Garden City, N. Y.
Ames, R. W., Boston.
Anderson, Charles J., Longwood.
Atkinson, Charles M., Brookline.
Atkinson, Edward, Brookline.
Atkinson, William B., Newburyport.

Bacon, Augustus, Roxbury.
Bacon, William, Roxbury.
Badlam, William H., Dorchester.
Barber, J. Wesley, Newton.
Bard, James, Framingham.
Barker, John G., Lynn.
Batchelder, G. W., St. Albans, Vt.
Beard, Edward L., Cambridge.
Beebe, J. Arthur, Boston.
Beer, Carl, New York, N. Y.
Bird, John L., Dorchester.
Bliss, Benjamin K., Boston.
Bock, William A., North Cambridge.
Bolles, Matthew, Boston.
Bolles, William P., Roxbury.
Bolton, John B., Somerville.
Boott, William, Boston.
Bottomly, Robert, Astoria, N. Y.
Bowditch, E. F., Framingham.
Bowditch, James H., Brookline.
Bowker, Albert, East Boston.
Boyden, Clarence F., Taunton.
Bradlee, John T., Boston.
Breck, Charles H., Brighton.
Breck, Charles H. B., Brighton.
Brooks, George, Brookline.
Brown, Atherton T., Roxbury.
Brown, David H., West Medford.
Brown, Jonathan, Jr., Somerville.
Brown, Joseph T., Boston.
Bullard, George B., Hingham.
Burley, Edward, Beverly.
Butler, Edward, Wellesley.

Carter, Miss Maria E., Woburn.
Cartwright, James, Wellesley.
Chaffin, John C., Newton.
Chapin, Gardner S., Chicago, Ill.
Chase, Joseph S., Malden.
Cheney, Amos P., South Natick.
Clark, James W., Framingham.
Clark, Joseph, Manchester.
Clark, Joseph W., Dedham.
Clark, Theodore M., Newtonville.
Collins, Frank S., Malden.
Comley, James, Lexington.
Crafts, William A., Boston.
Crosby, J. Allen, Jamaica Plain.
Cruickshanks, J. T., Natick.
Curtis, Daniel T., Milton Lower Mills.
Curtis, Joseph H., Boston.

Davenport, A. M., Watertown.
Davis, Frederick, Newton.
Davis, Thomas M., Cambridgeport.
DeMar, John A., Brighton.
Ditson, Oliver, Boston.
Dolbear, Mrs. Alice J., College Hill.
Doogue, William, Boston.
Doran, Enoch E., Brookline.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.
Dupee, James A., Brookline.

Eaton, Jacob, Cambridgeport.
Edgar, William, Newtonville.

Farrier, Mrs. Cynthia, Stoneham.
Faxon, Edwin, Jamaica Plain.
Faxon, Marshall B., Melrose.
Felton, Arthur W., West Newton.
Fenno, Warren, Revere.
Fergusson, Thomas M., Philadelphia, Pa.
Fisher, Sewall, Framingham.
Fletcher, Edwin, Acton.
Forbes, William H., Jamaica Plain.
Foster, Joshua T., Medford.
Fowle, Charles L., Dorchester.
Fowle, George W., Jamaica Plain.
French, William E., Boston.
Frohock, Roscoe R., Malden.
Frost, Edward, Littleton.
Frost, George, West Newton.
Frost, Stiles, Newtonville.
Fuller, T. Otis, Needham.

Gane, Henry A., West Newton.
Gardiner, Claudius B., Newburyport.
Gardner, John, Boston.
Gibbon, Mrs. James A., Dorchester.
Gifford, Stephen N., Duxbury.
Gilbert, Samuel, Boston.
Gill, Mrs. E. M., Medford.
Gleason, Herbert, Malden.
Godbold, Gustavus A., Chelsea.
Goddard, Thomas, Boston.
Goodwin, Lester, Brighton.
Gould, William P., Jamaica Plain.
Grant, Charles E., Concord.
Gray, Howard, Dorchester.
Gray, William, Jr., Dorchester.
Gray, William, 3rd, Dorchester.
Greene, Malcolm C., Dorchester.
Grew, Henry, Hyde Park.
Grover, William O., Boston.
Guerineau, Louis, Cambridge.

Hall, William T., Revere.
Hamlin, Delwin A., Allston.
Harris, Miss Ellen M., Jamaica Plain.
Harris Frederick L., South Natick.
Hartwell, Samuel, Lincoln.
Harwood, George S., Newton.
Hatch, Samuel, Boston.
Hayes, John L., Cambridge.
Hazelton, H. L., Hingham.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren, Belmont.
Hewins, James, Medfield.
Hews, Albert H., North Cambridge.
Hill, Benjamin D., Peabody.
Hill, Edwin S., Hyde Park.
Hill, J. Willard, Belmont.
Hill, Miss Katie A., Lowell.
Hinckley, Mrs. David F., Everett.
Howe, Rufus, Marlborough.
Hunt, Henry C., Newton.

Ireland, George W., Somerville.

Jameson, G. W., East Lexington.
Johnson, J. Frank, Boston.
Jones, Moses, Brookline.
Jordan, Samuel, Yarmouth.
Judkins, Rev. B., West Dedham.

Kelley, George B., Jamaica Plain.
Kendall, Jonas, Framingham.
Kenrick, Miss Anna C., Newton.

Lamprell, Simon, Marblehead.
Lang, John H. B., Boston.
Langmaid, Mrs. Mary, Somerville.
Langworthy, Rev. Isaac P., Chelsea.
Lee, Charles J., Dorchester.
Lee, Francis H., Salem.
Livermore, Miss Maria, Mount Auburn.
Loring, Charles G., Boston.
Loring, John A., Boston.
Lothrop, David W., West Medford.
Lothrop, H. A., Sharon.

Lothrop, Thornton K., Boston.
Lowell, John, Newton.

Manda, William A., Cambridge.
Marcou, Mrs. J., Cambridge.
Markoe, George F. H., Roxbury.
Martin, William J., Milton.
May, F. W. G., Boston.
McDermott, Andrew, Roxbury.
McIntosh, Aaron S., Roxbury.
McLaren, Anthony, Forest Hills.
McMillan, Robert, Whitinsville.
Meriam, Dr. Horatio C., Salem.
Merrill, J. Warren, Cambridgeport.
Merrill, S. A., Wollaston.
Meston, Alexander, Andover.
Mills, William, Somerville.
Minton, Peter J., Forest Hills.
Morandi, Francis, Malden.
Morandi, Francis W., Malden.
Morton, James H., Mount Hope.
Murray, Daniel D., Brookline.
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Norton, Michael H., Boston.
Norton, Patrick, Boston.

O'Brien, James, Jamaica Plain.

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Parker, George A., Halifax.
Parker, John, Boston.
Patterson, James, Cambridge.
Payson, Samuel R., Boston.
Peirce, George H., Concord.
Petremant, Robert, Roxbury.
Phillips, Nathaniel, Dorchester.
Pierce, Samuel H., Lincoln.
Plimpton, Willard P., West Newton.
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Pratt, Mrs. Mary L., Hingham.
Prince, Thomas, Roxbury.
Purdie, George A., Wellesley Hills.
Putnam, Charles A., Salem.
Putnam, Henry W., Salem.

Randall, Macey, Sharon.
Richards, John S., Brookline.
Richardson. E. P., Lawrence.
Richardson, Horace, Framingham.
Richardson, Spencer W., Boston.
Ridler, Charles E., Boston.
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Robinson, William, North Easton.
Ross, Charles W., Newtonville.

Safford, Nathaniel F., Milton.
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Sawtell, J. M., Fitchburg.
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Shedd, Abraham B., Lexington.
Shedd, Arthur B., Chicago, Ill.
Sheppard, Edwin, Lowell.
Sheppard, S. A. D., Newton.
Snow, Eugene A., Melrose.
Southworth, Edward, Quincy.
Spooner, William H., Jamaica Plain.
Squire, John P., Arlington.
Stearns, Charles H., Brookline.
Stevenson, Hamilton, Woburn.
Stone, Samuel G., Charlestown.
Storer, Charles, Natick.
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Strahan, Thomas, Chelsea.
Sullivan, Julius L. D., Somerville.
Swan, Charles W., Boston.

Tailby, Joseph, Wellesley.
Talbot, Josiah W., Norwood.
Temple, Felker L , Somerville.
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Torrey, Bradford, Boston.
Trautman, Martin, Boston.
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Walker, William P., Somerville.
Waterer, Hosea, South Natick.
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Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXVI.—LIFE MEMBERS.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member having once paid an admission fee may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII.— ADMISSION FEE AND ANNUAL ASSESSMENT.

Every subscription member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX.— DISCONTINUANCE OF MEMBERSHIP.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society, and the Treasurer shall erase his name from the List of Members.

The attention of Annual Members is particularly called to Section XXIX.

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A * denotes the member deceased. Correspondents of the Society and others will confer a favor by communicating to the Secretary information of the decease, change of residence, etc., of Honorary or Corresponding Members.

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*Thomas Allen, late President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.

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*Edward Nathaniel Bancroft, M.D., late President of the Horticultural and Agricultural Society of Jamaica.

*Hon. Philip P. Barbour, Virginia.

*Don Angel Calderon de la Barca, late Spanish Minister at Washington.

*Robert Barclay, Bury Hill, Dorking, Surrey, England.

*James Beekman, New York.

*L'Abbé Berlèse, Paris.

*Nicholas Biddle, Philadelphia.

*Dr. Jacob Bigelow, Boston.

*Mrs. Lucy Bigelow, Medford.

*Le Chevalier Soulange Bodin, late Secrétaire Général de la Société d'Horticulture de Paris.

Hon. George S. Boutwell, Groton.

*Josiah Bradlee, Boston.

*Hon. George N. Briggs, Pittsfield.

*Hon. James Buchanan, late President of the United States, Lancaster, Penn.

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*Augustin Pyramus de Candolle, Geneva, Switzerland.

*Hon. Horace Capron, late U. S. Commissioner of Agriculture, Washington, D. C.

*Commodore Isaac Chauncey, U. S. Navy, Brooklyn, N. Y.

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*Lewis Clapier, Philadelphia.
*Hon. Henry Clay, Lexington, Ky.
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*Hon. Millard Fillmore, late President of the United States, Buffalo. N.Y.
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*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society, New Brunswick, New Jersey.
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*Mrs. Mary Griffith, Charlieshope, N. J.
*Gen. William Henry Harrison, late President of the United States, North Bend, Ohio.
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*Thomas Hopkirk, late President of the Glasgow Horticultural Society.
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*Lewis Hunt, Huntsburg, Ohio.
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*Gen. Andrew Jackson, late President of the United States, Nashville, Tenn.
*Mrs. Martha Johonnot, Salem.
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*Gen. La Fayette, La Grange, France.
*Le Comte De Lasteyrie, late Vice-President of the Horticultural Society of Paris.
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*Baron Justus Leibig, Giessen, Germany.
*Prof. John Lindley, late Secretary of the Horticultural Society of London.
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*Joshua Longstreth, Philadelphia.
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Col. Theodore Lyman, Brookline.
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*Joseph Sabine, late Secretary of the Horticultural Society of London.
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*Nathaniel Wallich, M.D., late Curator of the Botanic Garden, Calcutta.
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*Hon. John Welles, Boston.
*Jeremiah Wilkinson, Cumberland, R. I.
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*Ashton Yates, Liverpool, England.
*Lawrence Young, late President of the Kentucky Horticultural Society, Louisville.

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*Don Francisco Aguilar y Leal, late U. S. Vice-Consul at Maldonado, Banda Oriental del Uruguay.
*Mons. Alfroy, Lieusaint, France.
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*Rev. Thomas D. Anderson, D.D., South Boston.
*Thomas Appleton, late U. S. Consul at Leghorn, Italy.
*Col. Thomas Aspinwall, late U. S. Consul at London, Brookline.
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*Isaac Cox Barnet, late U. S. Consul at Paris.
Patrick Barry, ex-Chairman of the General Fruit Committee of the American Pomological Society, Rochester, N. Y.
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*Eugéne Achille Baumann, Rahway, N. J.
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Napoleon Baumann, Bolwiller, Alsace.
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Thomas Hogg, New York.
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*Hon. J. F. Wingate, Bath, Me.
*Gen. Joshua Wingate, Portland, Me.
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TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1886.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1886.

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FOR THE YEAR 1886.

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The following papers and discussions have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the Boston Transcript. As here presented, the papers are printed in full, and the discussions are not only much fuller than in the weekly reports, bnt, where it appeared necessary, have been carefully revised by the speakers.

The Committee on Publication and Discussion take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature in the papers and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

O. B. HADWEN,
WILLIAM H. HUNT,
FRANCIS H. APPLETON.
} *Committee on Publication and Discussion.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, JANUARY 2, 1886.

A duly notified stated meeting of the Society was holden at 11 o'clock, the chair being taken by the retiring President, JOHN B. MOORE, who delivered the following address:

ADDRESS OF PRESIDENT MOORE.

Ladies and Gentlemen of the Massachusetts Horticultural Society:

It has been the custom of the retiring President to say a few words to you in relation to the condition of the Society, and its past work.

I may congratulate the Society upon its prosperity, and in no year has it been more marked than in the year 1885. With the means at command, with their large and valuable library for instruction and reference, with the improved and perhaps more scientific methods of culture adopted by the members, they ought to have made and certainly have made a great advance in horticulture from the time of founding this Society. This can be observed in the character and beauty of our exhibitions.

Among the causes of this prosperity are the lectures, essays, and discussions conducted by the Society; which have been of a high order, and have given new ideas to our members, and to the public, who have free admission to the lectures and may take part in all the discussions. The character and ability of these papers and discussions have given the Society a high standing, both at

home and abroad. Much credit is justly due to the Committee on Publication and Discussion for their efficiency in this work.

The finances of the Society were never in a more prosperous condition. Although the amount appropriated for prizes in 1885 was $1,800 more than in 1884, and notwithstanding extraordinary expenditures for improvements in the building, and for insurance we have, after allowing for the payment of the prizes now due, invested in bonds nearly $20,000; and there is something more which has already been earned that may be added.

This prosperity is due among other causes to the good judgment and care of the Finance Committee and the Treasurer; and also to the Committee of Arrangements, who have successfully directed the exhibitions for which admission fees are taken.

The building is in better condition than a year ago; the reports of the various committees are all in; and, with the aid afforded to the Secretary, the TRANSACTIONS, which were much delayed, are now published up to the present time, and bear upon their face that correct and perfect finish for which our Secretary has so long been distinguished.

Ladies and Gentlemen,—With my best wishes for the continued prosperity of this Society, I have the honor to introduce to you the President elect, Dr. Henry P. Walcott.

President WALCOTT, on taking the chair, delivered the following inaugural address:

ADDRESS OF PRESIDENT HENRY P. WALCOTT.

Ladies and Gentlemen:

At this first meeting of the new year, in obedience to an honored custom, it becomes my duty as your official representative to briefly recall some of the events of the past year, to invite your attention again to the more important recommendations of the standing committees, and to add the few suggestions that occur to me as to our future policy.

Of our former associates who have died in the past year, three at least should be named,— Mr. P. B. Hovey, who joined this Society in 1829, and was for some years a Vice-President and Chairman of one of our most important committees; Mr. Hervey Davis, for four years Chairman of the Fruit Committee, and a constant exhibitor; and Mr. Charles O. Whitmore, who freely

gave to this Society the great benefit of his financial ability, with results far surpassing the money value of the beautiful statue with which he adorned this building. In this Hall, so largely the result of his untiring energy, he will be long and gratefully remembered.

Let me turn for a moment to one* among the living, whose active concern in this Society has spanned, saving a few months, the whole of its existence. Venerable leader of us all — old only by the written record, young in your enthusiasm for our captivating art — long may you be spared to us and to this world of flowers and of fruits.

Two only of the original members of the Society are now living,—Henry A. Breed, of Lynn, whose presence we gladly welcome on this occasion, and John B. Russell, for some time resident in another state.

The finances of the Society appear to be in a very satisfactory condition. The Treasurer has not yet made up his final report, as the accounts of the Proprietors of Mount Auburn Cemetery will not be ready till later in the month; but, assuming that we receive the same sum from Mount Auburn that we did in 1885, and this is probable, the gross receipts for the year are (including the balance on hand January 1, 1885) in round numbers $34,330; total expenditures $17,723. Of the balance, $16,607, $6,376 have been added to the sinking fund, leaving a balance on hand January 1, 1886, of $10,231.

In September last the American Forestry Congress met in this city. In recognition of the necessary and intimate relations between Forestry and Horticulture, this Society gave to the Congress the use of these halls; and also appointed a Committee for the purpose of showing such attentions to the visitors as were within the power of the Society. The courtesies thus offered were warmly acknowledged.

The Committees on Fruits and Vegetables report respectively exhibitions of interest fully equal to those of preceding years. The latter committee call attention to the influence of prizes as superior to that of gratuities in a certain class of awards, and it seems to me that this conclusion may very properly be extended to awards made at any of the exhibitions. A prize to be awarded for some well-defined, well-understood quality in plant, flower, fruit, or

*Hon. Marshall P. Wilder.

vegetable, will, by awakening a sharp competition, be much more likely to bring out the best skill in gardening than the simple "gratuity," however large.

Fruits and vegetables have been objects of competition through so many years that any improvement in them must be the result of unusual skill. A former President publicly expressed the hope that grapes in this country, cultivated under glass, might be brought to equal the highest results of European culture. The general opinion, as well as the judgment of the Committee, upon the unusual merit of some grapes shown at the Annual Exhibition foreshadows the realization of that wish.

Our exhibitions have throughout the year attracted the attention of the public to a greater degree than ever before — the total receipts therefrom reaching the very considerable sum of $3,540; to this general success the Rose Show (owing to unfavorable weather) makes the sole exception. Yet even then the President of the Society compelled the reluctant elements to yield to him his wonted prizes. The Annual Exhibition was one of the most successful ever held by the Society, and perhaps the best. The receipts of the Chrysanthemum Show — nearly equalling those of the main exhibition of the year — are an evidence of the increasing interest in this flower, possibly somewhat influenced by fashion, but with a real foundation in the fact that its blooming comes at the dullest season of the floral year. The generous prizes offered for Bulbs at the Spring Exhibition, brought out specimens and collections of exceptional merit; the same wise liberality will, undoubtedly, secure a success at least equal the coming spring.

The almost priceless collections of plants which have made so important a part of our displays in past seasons have been again placed at the service of the Society and the public with the generosity of former years. The Flower Committee express the belief that the increased competition is a direct result of the larger prizes of the past year; and, very properly as it seems to me, they urge the importance of bestowing the great prizes upon specimen plants, rather than upon miscellaneous collections of cut flowers.

The Committee on Gardens, in addition to the usual report upon the condition of the various private gardens visited, have given well-deserved and appreciative notice to two subjects of unusual importance. The first of these is the movement for the establishing of a Great Natural Park in the Middlesex Fells. Past efforts

in this direction, notwithstanding a general interest on the part of the public, owed much of their vitality to the untiring, unselfish work of the late Elizur Wright. It is to be hoped that some one may succeed to his place, able as he to attract the attention of the public, and equally willing to make some sacrifices for the general good. Whatever help the influence of this Society can give will, I doubt not, be lent to a plan that offers, not to this generation alone but for all time, the educational advantages of a great wild garden, unequalled in extent or variety. The second subject treated is fortunately a fact accomplished, — the Arnold Arboretum, — endowed by an Honorary Member of this Society; carried to its present stage of success and abundant promise for the future, through many and perplexing difficulties, by our honored associate, Professor Charles S. Sargent.

The treasures of this collection, already known to a few, can only be properly appreciated when the Director's plans for final planting are fully carried out; but the advantages of a collection of trees and shrubs, hardy in this climate and correctly named, have already been felt.

The Library Committee and the Librarian report a continued increase in the number of our books, in the use made of them, and in the facilities offered for their use — but also the old and well-grounded complaint of insufficient shelf accommodation.

A member of this Committee until the present year, I heartily agree to all that is said in this and preceding reports, and will again call your attention to a few points that appear to have occupied the minds of some of our members during the past year. The great value of this collection of books is admitted; it is the best horticultural library in this country, and I know of none in Europe to equal it, either in the possession of a society, or of a private individual; it is a collection rich, not alone in books of scientific or literary value, but in all that can be found of a distinctly practical character. The Chairman of the Committee, probably more familiar with the contents of these shelves than any other member except our Librarian, has made a practice of consulting book-notices, catalogues, and advertisements; from the titles thus collected the Committee has made selection, for immediate purchase, of those books most likely to meet the general want. The more valuable works of a scientific character, including Floras, and Reports of learned Societies, have been purchased as occasion offered

and our funds permitted. The conveniences for using the library have, notwithstanding our crowded condition, been much improved; the increased though still very insufficient shelving has made books more accessible; the presence of an accomplished Librarian has helped the inquirer for knowledge to the more direct and shorter roads; the card catalogue of plant pictures, thanks to the chairman's perseverance, has also been of material service.

As the result of these improvements, there has come an enlarged use of the books. This may be seen in two ways; by the greater number of books recorded as borrowed, and by the more numerous readers here. The record-book (though it does actually show in the past year more books taken out) is not a conclusive test, for the following reason, to which I think all familiar with great libraries will assent:—that an increase in the conveniences for consultation will diminish the number of books taken out. Most of us come here to obtain information upon some limited subject,—the identity of a specimen, the question of a name, — if we can ascertain these facts without taking a large and costly volume home with us, we are glad to do so; and care very little if the register does not show that we have been here; and observation does show this increase in the number of readers. It is also said that there are books not taken from the shelves from one year's end to another. Possibly this is so; and yet these very books, when wanted, may be of the greatest service. It is one of the functions of great libraries to store the books that the individual cannot afford to keep. It is also true that many books are in foreign languages. With regard to these I will quote Lord Bacon's saying — "Some books also may be read by deputy" — and I am very sure that any information so gained will, in this Society at least, come to the surface for the benefit of us all.

The Committee of Arrangements, to whose judicious and active care so much of the success of the exhibitions has been due, state forcibly the necessity for larger floor accommodations; and I feel sure that all present at the Annual Exhibition will agree with them. It was much to be regretted that the finest collection ever brought together by the Society should not have been more suitably displayed. A slight experience has brought forcibly to my attention the labor, the expense, and, more than all, the injury to plants, caused by the carrying of them to the upper hall. It can easily be understood, then, what serious damages an exhibition in-

volves in the case of the extremely valuable plants shown by a number of our prominent exhibitors,—losses that can only be made whole by the fairly earned consciousness of a great public benefaction, gratefully acknowledged.

With regard, then, to our building, we find that the accommodations for our books are quite insufficient, that two at least of our exhibitions have outgrown the floor space of the halls, that social and business changes have rendered difficult, if not impossible, the earlier and more acceptable use of them; and I therefore urge upon the Society the immediate and careful consideration of what seem to me to be the most important questions now before us; the alterations, if any are necessary, and the future uses of this building.

Ladies and Gentlemen:—You have elected me to this your highest office.

I approach its many duties with diffidence, knowing full well how much will be expected of him who follows the many eminent men who have filled this place; but confidently trusting in your continued good will, I shall do all that is in my own power to protect and advance the interests of the Society.

On motion of Hon. Marshall P. Wilder, the thanks of the Society were unanimously presented to the outgoing and incoming Presidents for their interesting addresses.

On motion of C. M. Hovey, it was voted that a committee of three be appointed to take into consideration the suggestions made in the President's address. The chair appointed as that Committee Charles S. Sargent, C. M. Hovey, and F. L. Ames.

The appropriations recommended by the Executive Committee on the 7th of November and the 26th of December were unanimously voted, as follows:—

For Prizes and Gratuities,—	
For Plants and Flowers ($200 of this amount being for gratuities during the winter months)	$2,800
For Fruits	1,700
For Vegetables	1,000
For Gardens	300
Total for Prizes and Gratuities	$5,800

For the Library Committee, for the purchase of magazines and newspapers, binding of books, and incidental expenses of the Committee .	300
For the same Committee, to continue the Card Catalogue of Plates	100
For the Committee on Publication and Discussion	250
For the Committee of Arrangements,—this sum to cover all extraordinary expenses of said Committee	300
For the same Committee, to cover the deficiency in the appropriations for the years 1884 and 1885	94.80

The Secretary read a letter from Mrs. Mary E. Whitmore, acknowledging the receipt of the resolutions passed by the Society in memory of her husband, the late Charles O. Whitmore, and expressing the gratification of the family therewith.

The Secretary also announced that the Schedule of Prizes for 1886 was ready for distribution.

The Chairman of the Committee on Publication and Discussion announced that the series of meetings for discussion would commence on the next Saturday with a discussion of "New Fruits of Promise;" to be opened by E. W. Wood, Chairman of the Fruit Committee.

Adjourned to Saturday, January 9.

BUSINESS MEETING.

SATURDAY, January 9, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, President WALCOTT in the chair.

On motion of Edward L. Beard it was *Voted*, That the Committee charged with procuring a portrait of the Hon. Francis B. Hayes, late President of the Society, be requested to perform the same duty with respect to ex-President Moore.

Adjourned to Saturday, January 16.

MEETING FOR DISCUSSION.

Owing to a severe snow-storm, but a small number of persons were present, and the meeting was adjourned for one week.

BUSINESS MEETING.

SATURDAY, January 16, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, President WALCOTT in the chair.

The Annual Report of the Committee on Publication and Discussion was read by O. B. Hadwen, Chairman, accepted, and ordered to be placed on file.

Adjourned to Saturday, January 23.

MEETING FOR DISCUSSION.

A TRIP TO THE TROPICS.

By JOSEPH H. WOODFORD, Newton.

Our Committee on Discussions having learned that I lately returned from a voyage to Central America, and being desirous that others should know more about this wonderful country than can readily be got from books, have prevailed upon me to relate my experience while engaged in this trip; and this I will now proceed to do in as brief a manner as possible.

The voyage commenced on the 3d day of October of last year, with a thick fog and a head wind. We were compelled to put out to sea immediately to escape the fog, and then laid our course in a straight line for the Bahamas, considering that a straight line is the shortest distance between two points. It may be so in most cases, but one "can't 'most always tell" if this is the case on a voyage; particularly if the ship is having sea mountains to climb all the way, and finding the steepest ones at the end of the straight line, in the "roaring forties." Lady Brassey's descriptions of the seas around the Bahamas are very interesting and truthful, and I

refer you to her account of her trips in the "Sunbeam" for particulars of very interesting voyages in those waters.

While on the voyage, at times when the weather is pleasant, one often recalls the words of the old song,—

"A life on the ocean wave,
A home on the rolling deep,"—

and under auspicious circumstances it seems beautiful, and one can see a vast deal of comfort and enjoyment in it, but when we get on shore and away from the haunts of men we recall the other good old song which says—

"Some love to roam
O'er the dark sea foam,
But a life in the woods for me,"—.

a life which seems to me, as compared with a life on the ocean wave, much more suggestive of the acme of human enjoyment in this world of ours.

As we approach the coast of the tropics, we are pleased to notice the great difference in the forests from those we are accustomed to see. All along the coast the cocoanut palm rears its beautiful head, and on nearer approach we notice an abundance of its fruit in all stages of ripening. The forests are unlike any we are familiar with in our own country, presenting a different foliage, and a more dense appearance down to the water's edge.

Our first landing was at Balize, in British Honduras, the most important city on the coast, and probably the most enterprising. The principal portion of the inhabitants are Spaniards, negroes, Hindoos, and the native Indians, which, with all sorts of intermediate strains, make up a motley population peculiar to this country, and not such as we are accustomed to see at home. Our stay at Balize at this time was limited, and we therefore had no chance to study the people, but learned afterwards that they are in general lazy, indolent, and very fond of intoxicating drinks. The hire of an able-bodied man is $1.25 per day; but it is worth more than that to get a day's work from some of them.

The next port we made was Livingston, in Guatemala. The town consists principally of a considerable number of mud huts; all thatched with palm leaves. As it sits on quite an eminence, it presents the appearance of a thrifty little town, and this idea is not dispelled on landing. Livingston is situated at the mouth of the

Rio Dulce, a watercourse which extends from a large lake in the interior of Guatemala to the Caribbean Sea. There are several small steamboats plying on this river and lake, making regular trips up and down, and I have to regret that I was unable to make a round trip in one of them.

The river after we get over the bar at the mouth is very deep; and as it comes down through a lofty range of mountains, densely wooded to the water's edge with tropical forests, it presents to the lover of inland navigation a most beautiful and enchanting scene. Just back of Livingston and on the Rio Chocon, Mr. William T. Brigham, who read a paper before this Society in 1884, has established a Tropical Products Company, and is very largely engaged in growing sugar cane, coffee, India rubber, and in fact all the best productions of a tropical country, and as Mr. Brigham is present he will tell us of his success.

The great drawback to the navigation of all the rivers in Central America is the presence of sand bars accumulated at their mouths, so that ships must lie out in the bays, from a half-mile to one and a half miles from shore, while loading. This is rather awkward in a rough sea, and often detains ships beyond their time and at serious expense.

While walking through one of the streets of Livingston I came upon a man and woman who were building a house. The frame consisted of some poles set in the ground, and to each side of these were tied strips of the midribs of leaves of palm, and these were also tied together, at regular intervals, with some very tough vine from the woods. I did not see a nail used in the whole structure. Alongside of this house an excavation had been made about two feet deep, and in this the soil which had been taken out was being kneaded into mortar by the feet of the man and woman. After the mud had become adhesive and was of the proper consistency for handling, a small tray full of it would be taken out, and the process of building up the sides of the house by filling in between the posts would go on till the house was complete. The roof is always finished before the sides, so that the mud is protected from the rains, and in due course of time it dries and makes a durable house. I was told that from ten to fifteen years would pass before the house would require rebuilding. The roof is a thatch, generally of the fronds of the Cohune palm; this is preferred, because it does not readily take fire. The fronds are split the whole length through

the midribs and then tied to the rafter poles. They are laid on quite thick, sufficiently so to make the roof proof against leakage, and to protect the inmates from the fervent heat of the sun. I was told by one of the English merchants, who was having his thatch relaid, that it was better than any other kind of roof, as it kept the bungalow cool and dry. About seven feet of rain is the annual fall in that country, and you will readily see that the roof is a very important factor in the sum total of one's happiness.

From Livingston we proceeded to Omoa, a picturesque little village situated in a beautiful indentation of the coast, and at the foot of the Omoa Mountains; which rise immediately back of the village to the height of 9,000 feet, and are wooded with beautiful shrubs and trees to their very summits. Nothing can be prettier than the view of this village and the surrounding scenery, from the deck of a steamship; but as I did not land at this point I cannot speak of the inhabitants from personal observation.

Our next stop was at Puerto Cortez, one of the most important points on the coast, being the terminus of the only railway in Spanish Honduras. The bay makes a good harbor, and at one time while our steamship was there five others lay at anchor alongside. Some were loading mahogany and cedar for Europe, while the others were taking bananas, cocoanuts, and any other produce procurable, for the United States.

Puerto Cortez is situated on a tongue of land running out into the sea, and forming one side of the bay; and on the centre of this tongue of land is the railway track. There is no other street in the village, and the houses and stores are set on posts on either side of this street or track. The land is very low, and in the rainy season is all submerged except the railway track. Vegetation is of very quick growth and decays as easily as it grows; therefore this place is very unhealthy, everybody being subject to malarial fever. We had not been there more than a week before half our crew were under the doctor's care, although our ship was a half-mile from shore. I did not get the fever, as I was careful not to drink the water of the country.

The other terminus of this railway is San Pedro, a snug inland village, thirty-seven miles from Puerto Cortez. It was proposed when this railway was begun to extend it across Honduras through the capital city, Tegucigalpa, to the Bay of Fonseca on the Pacific Ocean side; but after the work was under way, and bonds to the

amount of thirty millions of dollars had been negotiated in Europe, it was thought best to have an insurrection and overturn of the government, so that those who had obtained the money might retire on a competency without accounting for what they had received. This was accomplished, and today Honduras is in consequence the poorest of the Central American States; with a railway of only thirty-seven miles in length, and a debt that will never be wiped out. The railway with its rolling stock and workshops is now leased for $1,200 per year, and the trains run as often as employment offers. We chartered a train of three cars and an engine to go to San Pedro and return—we taking coal from the ship to run the engine—and even with this precaution we were seven hours on the way to San Pedro. However, we were well repaid for the trip, as the line went through a region of the most beautiful foliage I ever saw. Banana orchards and cocoanut and Cohune palms extend for miles along both sides of the track, and when these were passed forests of unexampled luxuriance greeted us on every side. All the trees around here have a most curious formation at the ground, as their roots seem to commence far up the trunk and gradually spread out into huge buttresses; which afford the breadth requisite for supporting their enormous growth in the soft ground of the tropics. This base has not only to support its own superstructure, but also innumerable vines and creepers, affectionately clinging to the trunk and gaining strength as they grow, even to the very top. Often the usurping vine grows with such an overpowering vitality as to completely smother its support. The branches of nearly all the large trees are covered with all sorts of orchids and other epiphytal plants, clothing them so profusely that in some instances, when completely soaked with moisture, the mass becomes too ponderous to remain where it grows, and often there falls at once to the ground a quantity sufficient to stock a large orchid house. In fact, vegetation is so very rampant in this country that whenever a seed happens to lodge on a tree, it almost immediately germinates and begins to grow, and then comes the struggle as to which will survive the longest, the horse or the rider. I have seen trees completely covered and smothered by others of quicker growth, and they presented a wonderfully peculiar appearance.

To a person not accustomed to tropical vegetation, I think the most striking trees are the Palms. The Cocoanut is the most

familiar, as this always grows along the coast, and often with its roots in the salt water; where it appears to thrive about as well as on a sweeter soil. Palms of various kinds, some with smooth trunks, some covered with spines, and some with a fibre suitable for making into cordage, are to be found in all the forests of Central America. The most beautiful of the large-growing palms is the *Attalea Cohune*. This resembles in general appearance a young cocoanut palm, but the trunk never becomes so elongated as it increases in age. The trunk of the Cohune palm is thicker and more sturdy; and at the base of its leaves is found the hempen fibre used for cordage, together with several bunches of nuts. I think that for beauty and magnificence of foliage it is the most wonderful of the Palm family. It grows well only on very rich soil in the interior; and as portions of Honduras are extremely fertile this palm in those sections attains its highest perfection. I have seen the fronds thirty feet in length and four feet broad on miles of trees, and intermingling overhead in most wonderful luxuriance of growth; creating in the mind of an enthusiastic horticulturist a desire that all other admirers of the beautiful might behold the same magnificent scene.

This Cohune palm bears at the base of the fronds great bunches of nuts, exactly resembling huge clusters of grapes; and I have often wondered, when looking over the old family Bible, whether the artist who made the picture in it usually supposed to represent two men carrying a bunch of grapes on a pole between them was not acquainted with the Cohune palm, and whether, in his desire to perpetuate the memory of this beautiful and useful tree, he had not depicted this fruit on its way to the crushing mill—there to be made into the very finest and best oil either for culinary or mechanical purposes—instead of grapes to be made into wine.

The woods are full of vines and creepers, in most places so numerous and luxuriant as to make the forest impenetrable for man till he cuts his way through with the ever present machete (a sword-like knife about three feet long). Sarsaparillas, Dipladenias, Bignonias, etc., etc., run wild and in confusion, the useful and the ornamental all mixed together.

Our next stopping place was at the mouth of the River Ulloa, and if there was ever a place which made me think of Pandemonium this was it; as it was inhabited principally by monstrous sharks, alligators, mosquitoes, and negroes. The negroes seemed

to be on good terms with all their neighbors, for they were not careful about getting into the water, but they cautioned us to be careful about getting overboard, as the sharks and alligators were waiting for a change of diet.

Mahogany, cedar, rosewood, and fustic are floated down this river and taken alongside ships in rafts, from which the logs are detached and hoisted on board. The mouth of this river is considered a very dangerous place for ships to lie, as it affords no shelter from hurricanes, which sometimes arise very quickly on this coast.

After loading what timber we could comfortably take, we returned to Balize, touching at the various ports on our way. As we were to be detained a day here, I made arrangements to go into the woods and collect some plants. A donkey, a cart and driver, a long handled chisel, and a machete completed our equipment, and we started on the principal street leading out of the city past the Governor's house. After going about three miles, the road became choked and nearly impassable, and we turned about, and made our collection on our way back to the city. The cart was loaded to its full extent with as many epiphytal plants as the donkey could draw, and when I packed them on the wharf preparatory to sending on board I found I had nine quite large cases full. There might be among them many of no value, but I took what there was within my reach, knowing that when we have the plants growing we can easily find out whether they are of any consequence. Some of the Tillandsias, Billbergias, Orchids, Cacti, and Aroids collected are very curious, and I was well repaid for my investment of five dollars in the excursion. I was told by some of the merchants that at a distance of about thirty miles inland, up among the mountains, I could obtain very much choicer varieties of orchids, and in quantities sufficient to load a ship; which statement I have no reason to doubt.

It would be impossible to enumerate the names of the trees, shrubs, and plants I saw in the forests, as I had no time for critical examination; but I can heartily recommend the country as a rich field for botanists or collectors of plants—a region in which they can fairly revel in nature's voluptuousness.

Its inhabitants are laboring under serious disadvantages. They have no incentive to any labor beyond that which will produce their daily bread, as there are no enterprises into which they

can put any surplus earnings. This makes them lazy, unambitious, and careless; and consequently but small areas of land are cleared for cultivation. The small farms when once subdued and planted yield crops all the year round, therefore the husbandman has continually at hand food for the subsistence of his family. The currency of these countries is silver, and is at a depreciation of nearly thirty per cent, so that every ship that goes there for trade always goes provided with the money current in the country, to pay for produce. This money can be bought of any of our bankers at seventy cents to the dollar. The products of the country are not dear, if one has a near market in which to dispose of them. When I was there bananas were worth fifty cents per bunch, cocoanuts ten dollars per thousand, oranges fifty cents per hundred, and lemons, limes, and pineapples were equally cheap; and, as these fruits are continually maturing, a ship can be loaded along the coast at any time. New Orleans, which is but five days sail by steamship from this coast, is the only large market available for this perishable fruit.

This country offers an abundant field for the exertions of an enterprising population; for well directed labor, continuously applied, is sure to meet with a bountiful return in the natural productions of the country. Yet still it remains the lazy man's paradise, and probably will until the enthusiasm of the live Yankee fills the land with homes such as we have in New England.

We completed our return voyage without incident, having been about six weeks on the trip.

Discussion.

William T. Brigham, the President of the Tropical Products Company, was called on by the Chair, and said that since he last had the pleasure of telling the Society what he thought could be done in Central America he had again visited that country and purchased a tract of twenty square miles, of which three hundred acres was cleared and planted with cacao, coffee, India rubber (Castilloa), figs, nutmegs, and oranges, from the Botanic Garden of Jamaica. They did not intend at first to plant oranges, which bring only two and a half cents for half a bushel of the finest quality. The Castilloa yields at five years from planting eight gallons of milk, which will make sixteen pounds of rubber. The

rubber trees are planted to shade the cacao and coffee, which will not endure the full rays of the sun. The Erythrina is commonly used for this purpose; but it is of no value otherwise. Until the cacao and coffee plants are two feet high they are shaded with mats. They also planted bananas and plantains between their cacao and coffee plants, and had twenty thousand bunches of bananas, for which they expected to get twelve thousand dollars, but when these were nearly ready for market floods came and swept some of them away. When the trees were cut down the trunks, some of which were a hundred and fifty feet long, were left to rot, as they would do in two years, but the flood lifted them so that they acted as scythes and cut down the bananas. They got rid of the logs, but in an expensive manner. They had four varieties of sugar cane from Jamaica, which was planted in the roughest possible manner,—the Caribs made furrows with hoes, in which the canes were laid down, and chopped into lengths of two feet as they sprout only at broken joints; they were then covered with the hoe about six inches deep. In nine months they grew nine feet high, while in the Hawaiian Islands it would take eighteen months to get that growth; and the cane was soft and juicy. In Hawaii and Cuba the cane has to be replanted every five years, losing one year, but here it does not. He believed sugar could be produced here at half what it would cost in Cuba; but they had no machinery, and with the high duty and low price in the United States it would not pay. Suitable machinery would cost eighty thousand dollars. They purchased a large number of pigs, which they fatted on sugar cane. Their greatest want was a skilful propagator to take care of their seeds before and after germinating. The seed of the India rubber tree is very difficult to grow; only about ten seeds out of three thousand sent by the Guatemalan Government germinated. The only way to preserve it over a fortnight is to plant in boxes and water three times a day. He thought an India rubber tree nursery would be a good enterprise. Not anticipating the effect of the sun, they selected the dryest land for planting, and in the dry season it was almost dried up; so that they will have to bring water for their bananas and plantains. In Louisiana the planters are giving up cane, and planting rice as more profitable. In Central America the upland rice when sown broadcast grows six feet high, whereas in Louisiana the speaker had never seen it more than eighteen inches or two feet high in the swamps, or fifteen

inches on upland. The Central American rice is of far better quality than that produced in the United States, but there is no hulling machine in the country. Figs grow rapidly, and the foreign grapes thrive admirably.

There are in the woods many beautiful timbers for cabinet work that we know nothing about; but they are hard to get out, for the soil is so soft that oxen sink in it almost to their bellies. Many are so heavy as to sink in water, but sometimes rafts are built of mahogany and these heavy woods are placed on them and so floated down. There are also many valuable drugs, saps, and juices unknown to us; one tree when cut down exudes a natural paint. The *Simaba Cedron*, found in the southern republics, is reputed a specific for serpent bites.

The states of Central America are almost all burdened with debts. In one of them a loan of $27,000,000, negotiated in Europe for building a railroad, yielded only $5,000,000 for that purpose, the remaining $22,000,000 being swallowed up in the commissions of the negotiators; and a similar case occurred in another state. The railroad which was built was of narrow gauge; and the sleepers sink in the soil and are eaten by insects and soon break, so that there are only three miles where they dare to run a locomotive. The road is used for the transportation of fruit; which in thirty miles of such travel is damaged more than by a long sea voyage.

The inhabitants are ready to welcome all foreigners except Chinese. The duties on imports are very high; at Puerto Cortez a dozen cans of tomatoes were charged with a duty of $9.67; and a cooking stove which would cost $26 here cost $140 in Guatemala City. The grant to the Tropical Products Company includes a free port of entry, which in a country where duties are so heavy is a very important concession. The government has kept its word with the Company. The physique of the natives is fine and labor is plenty. The merchants deal principally in aguardiente and gambling implements.

The Company sent to the Southern States of our nation for negroes, but without success, and then used Caribs, who at first wanted pay in advance but afterwards they did not want their pay at all. The government encourages intemperance because it is a source of revenue; the natives drink pure alcohol and lie down in the gutters. The native laborers must not be induced to lay up

money, for if a man accumulates ten dollars he is provided for as far as he can see. The Company had been obliged to provide and sell them lanterns for lighting their houses, and shoes for their feet; to induce them to buy sardines, lobsters, etc.; and to encourage the women to use mirrors, beads, ribbons, etc., so that they might spend their money and go to work again. The laborers find that work does not hurt them but improves their appetites.

Negroes from Alabama planted cotton and could pick it every day in the year; it grows to a tree in that climate, and it must be pruned to keep it within reach of the pickers. They had to encourage their laborers to raise food, for, though a man could raise sufficient food for his family with very little labor, they would beg of countrymen.

In answer to a question how long it took for cotton to grow into a tree, Mr. Brigham said that in six months it grew so high that he could not reach the lower branches, and the stem was eight inches thick, and a ladder was required to pick it. This was in latitude 15° on the Atlantic.

The rainy season lasts about nine months; every night during that time it rains so heavily that an umbrella is of no use. The dry season is not like that of California, where the dust is six or eight inches deep; but there are several showers every week. The highest range of the thermometer was 86°, which is not so uncomfortable as 76° in Boston; and the lowest was 70°. There is no summer and no winter, and you can plant so as to have crops come into use every day in the year. If pineapples are ripe in January this year, they will not be ripe at the same time next year, but in nine months from the preceding crop; and the case is the same with bananas. The pineapples average five pounds in weight, and the whole interior is eatable. Some bananas form seeds, but in most varieties the seed is abortive. When sprouting they look not unlike crocuses. The stem of the banana is cut down as soon as it has borne its fruit; it contains a fibre between hemp and silk in character.

The greatest drawback to settling in the country is the absolute isolation; the natives are no society. There is malaria, as there is in all countries where forests are being cleared, but it is probably not anything like as troublesome as colds are here. His son had been there three years and was as healthy as any man in Boston. There is a difference in the character of the coasts; the low land

is bordered by a fringe of lagoons where mangroves grow, and the roots collect a scum which corrupts in the tropical sun; and such places are exceedingly unhealthy. On the Pacific Coast it is very unhealthy for white men. Near Livingston there are limestone mountains, and the surf rolls in in the afternoon; and though the breezes which cause it are uncomfortable for navigators they are good for health. Aguardiente will kill a man quicker there than here. Calcutta is said to be unhealthy, but if men take care of themselves and eat vegetables and fruit they can preserve their health. In such hot climates meat can be kept but a very little while, and in Central America when a cow is killed they blow a conch shell to inform the dwellers in the vicinity that beef is to be had; and the meat is cut in long strips and roasted on skewers. They have baked beans superior to any in Boston; the beans are black and are seasoned with delicate peppers, called chilis, and tomatoes. In Spanish Honduras there are high valleys with magnificent pasture land, where one can live infinitely better than in New England.

In answer to an inquiry whether vegetables could be cultivated in Central America, Mr. Brigham said that cabbages grow five feet high and pineapples can be got any day. There are no annuals like turnips, etc. Where the refuse of pineapples is thrown out it grows and forms an impenetrable thicket. The banana is like the bread-fruit in never forming seeds; pineapples sometimes form seeds; the banana will not bear fruit in the shade. Small corms of bananas require eighteen months to produce fruit. In the East Indies there are soils where cultivation has been carried on for thousands of years. The speaker had seen on his plantation vegetable mould fourteen feet deep. In Costa Rica there is a deposit of volcanic sand of great fertility. The climate varies between the eastern and the western coast; when it is wet in one it is dry in the other.

Jackson Dawson remarked that cotton is always shrubby in the tropics. Sea island cotton grows from fifteen to twenty feet high in St. Helena.

Fruits that Promise Well.

The discussion of this subject, which was assigned for the preceding Saturday but prevented by the storm, was here taken up.

E. W. Wood, Chairman of the Fruit Committee, who had been

appointed to lead, remarked that the transition from the glowing accounts of tropical vegetation to the common fruits of our own country was great and sudden, especially after the extremely severe weather which we had just endured, yet perhaps the latter subject is more interesting practically. It is difficult to confine the subject to new fruits, for many that are new in one place are old in another. A change is not so easily brought about in fruits as in some other things; a machine may show its value in a single year, but it is only by long continued experience that we decide what varieties of fruit are best. Most fruits are best in the place where they originated, and deteriorate when they go away from it, but there are exceptions, such as the Wilson strawberry and the Gravenstein apple.

Probably as many good apples have originated in Massachusetts as in any place of equal extent, and our winter apples possess so many good qualities that it is difficult to surpass them. The Baldwin grows well, bears early, and is of good size and color, and it will probably be long before anything will be found to displace it as a market apple. Worcester county presents some good apples, among which is the Palmer Greening or Washington Royal; a late keeping variety, green changing to yellow when ripe, and of excellent quality, bringing from fifty cents to a dollar per barrel more than Baldwins. It originated in Leominster. The Sutton Beauty has been longer introduced, but is not as well known as it deserves to be. It is of good size, excellent quality, and handsome, and has other good points. A seedling apple sent to this Society in 1884 by John F. Jones, of Contoocook, N. H., is large and of solid dark red color and as attractive as the Fameuse. The Chenango apple is little known here; it is large, handsome, of fine quality, and valuable for family or market.

Among the newer pears the Frederick Clapp has been sufficiently tested to show that it is of superior quality and a good grower and bearer and should be in every amateur's garden. The President Clark, a seedling raised by the late Francis Dana, is of the highest quality, but is not yet disseminated. The Keiffer has been well written up and well paid for, but there has never been a specimen shown here that could be considered of fair quality as a dessert fruit.

Perhaps there has been more improvement in grapes in recent years than in any other fruit. The Worden and Moore's Early

have been adopted in general cultivation; the former is probably the best of the many seedlings from the Concord. The Cottage, raised by Mr. Bull, the originator of the Concord, and the Early Victor, a native of Kansas, are desirable early kinds. The Niagara ripens with the Concord; it is a vigorous grower and bears abundantly, and is a valuable white grape. The Hayes grape has been tested by most of the members of the Society; in quality it is superior to the Niagara. When the Fruit Committee visited Mr. Moore he set before them wine made from this variety, which experts thought the best wine they had ever tasted from a native grape. The Prentiss, which is said to be a cross between the native and foreign, is of fine quality; but has not fulfilled the hopes entertained of its vigor and productiveness. We shall have to look to pure natives for these points, which we may hope to combine with the best quality. Rogers's Hybrids, to the number of forty or fifty, were introduced under the most favorable conditions, but during the last season, although it was a remarkably favorable one for grapes, only thirteen dishes were shown at our exhibitions.

In plums, owing to the destruction of trees by the black wart and of fruit by the curculio, almost all the varieties may be said to be new. The Green Gage is unequalled in quality, but there are many better growers. The Jefferson, McLaughlin, Washington, Bradshaw, and Niagara are among the best.

In strawberries a change is brought about more quickly than in any other fruit, and we have seen more new varieties; meanwhile some old kinds have deteriorated and gone out of cultivation. Kinds that did well ten or fifteen years ago have become almost obsolete. The cultivation of the Hovey was continued until it ceased to produce good crops, and the same was the case with the Brighton Pine. The Triomphe de Gand has not been shown here for three years. Among the newer kinds which have become established as excellent market berries are the Charles Downing, Miner's Prolific, Sharpless, and Cumberland. The Wilson and Crescent are exceedingly productive, but of inferior quality. With amateurs the Hervey Davis, Wilder, and La Constante are favorites for their fine quality. Among the newer kinds not yet fully proved, but which promise well, are the Bidwell, Manchester, Belmont, and Jewell. Some have complained that the Bidwell does not carry out its fruit, but perhaps higher cultivation will obviate this. The Manchester is very prolific and of good size. The Belmont has been grown

very successfully by the originator; it is most productive and the quality is from fair to good—about on a par with the Sharpless. It is a late variety, with fine flesh, and keeps remarkably well. The Jewell is perhaps a little better in quality than the Belmont, and the size compares favorably with that of the Sharpless, while the form is better. Judging from the plants shown here last summer, it is very prolific, and it makes very strong runners.

Of the newer raspberries the Cuthbert is most popular and is becoming generally cultivated. The only new currant is Fay's Prolific, which in vigor and size of fruit does not compare favorably with the Versaillaise.

Hon. Marshall P. Wilder said that we live in an age of enterprise and progress in originating and introducing new fruits; and though many of them prove of little value the spirit which leads to this work is commendable. Many kinds once popular have disappeared or are disappearing, and their places must be supplied. In New England the interest in collecting pears has been so great that forty years ago A. J. Downing called it a mania. Over a thousand kinds have been tested; many have proved of no value, but from among these collections have come the fine kinds which stand out like stars in American pomology. Some supposed new kinds have turned out to be old ones; like the Baronne de Mello, a variety of high quality, which was discovered last season by persons who thought it new. Among other fine varieties which have not been appreciated are the Émile d' Heyst and the Waterloo; the General Warren, supposed to be a seedling of the late Francis Dana, proves to be identical with the latter. Mr. Wilder suggested that premiums should be offered for the resuscitation of fine old varieties. He considered the Washington Strawberry apple fully equal in beauty to the Gravenstein, and only second to it in quality. He could not agree with Mr. Wood in regard to the Rogers grapes. The Barry, Wilder, and others succeed with him almost as well as any varieties except the Concord and Moore's Early. Charles Downing preferred the Wilder to any other native grape. The Lindley is superior even to the Delaware; he showed it to eleven connoisseurs, nine of whom pronounced it best. It is a variety which we cannot dispense with. In some seasons the Rogers hybrids may mildew, but in others they do not. The speaker said, however, that his grapes have a very favorable location. He admired Mr. Wood's good taste in retaining the

Hervey Davis and Wilder strawberries, the former of which is a seedling from the latter. He commended the Jewell as a very remarkable variety; one plant had fifteen fruit stems, averaging ten berries to a stem. The Prince is probably a parent of the Jewell; it is as high flavored as any variety, makes a large stool, and bears an abundance of fruit. The Triomphe de Gand continues to grow with him as well as any other kind; a neighbor cultivates half an acre and has no other. The Parry is promising. Of raspberries the Souchetti, imported thirty years ago, took the first prize last year, and is perhaps the most valuable kind for family use. The Marlborough is a most remarkable grower; he had exhibited here a cane nine feet in length. It is not of the highest quality, but is very productive and seems perfectly hardy. It produces a host of suckers—sometimes fifty to a stool—which must be kept down or the crop will fail. The Caroline, which is a true hybrid between the Brincklé's Orange and a Blackcap, is hardy and valuable.

O. B. Hadwen, Chairman of the Committee on Publication and Discussion, remarked that all present had been interested in the discussion, and had learned from the practical experience of those who had spoken, and perhaps from long observation of their own, that new seedling fruits are necessary to take the place of those which have gone out. He announced for the next Saturday a paper on the "Cultivation and Transplanting of Forest Trees" by William C. Strong.

BUSINESS MEETING.

SATURDAY, January 23, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President BENJAMIN G. SMITH in the chair.

On motion of Francis H. Appleton it was unanimously *Voted*, That the State Board of Agriculture be requested to consider the desirability of *requiring* that every incorporated agricultural society, receiving the State Bounty, shall include the subject of *Forestry* in their annual discussions at their Farmer's Institutes.

Adjourned to Saturday, January 30.

MEETING FOR DISCUSSION.

The Forest Interests of Massachusetts.

By William C. Strong, Newton Highlands.

It is a prevailing impression that the climate of Massachusetts has changed since the days of its early settlement. But it is to be noticed that this impression is vague, and takes form in conflicting opinions, with the changing seasons, as they may chance to be either hot or cold, wet or dry.

However trivial may seem the value of such fluctuating and conflicting opinions, it is not to be disputed that certain very material changes, both in the climate and in the soil, have taken place in this State. The descriptions of early writers concur in showing that the country was originally covered with a heavy forest growth, from the mountains to the very brink of the sea; except where interrupted by the salt marshes, the meadows along the shores of rivers and ponds, and occasional open upland spaces where the Indians planted their corn. The scouting party sent out from the Mayflower reported even of Cape Cod that it was "all wooded with oaks, pine, sassafras, juniper, birch, holly, vines, some ash, walnut; the wood for the most part open and without underwood, fit either to go or ride in." (Mourt's Relation, 1622.)

In Wood's "New England Prospect," printed in 1634, the islands in Boston Harbor are described as covered with "good timber to repair their weather-beaten ships. Here also may be had masts or yards, being store of such trees as are useful for the same purpose."

And in regard to the quality and productiveness of the soil, similarly enthusiastic descriptions are given. In 1629 Rev. Francis Higginson wrote, "The aboundant encrease of corne proves this countrey to bee a wonderment. . . What will you say of two hundred fould and upwards? . . Our turnips, parsnips, and carrots are here, both bigger and sweeter than is ordinary to be found in England."

In the same year Master Graves describes the luxuriance of vegetation as follows:—"Thus much I can affirme in generall that I never came to a more goodly country in all my life, all things considered. If it hath not at any time been manured and

husbanded, yet it is very beautifull in open lands. . . No place barren but on the tops of the hills; the grasse and weedes grow up to a man's face; in the lowlands and by fresh rivers abundance of grasse and large meddowes without any tree or shrubbe to hinder the sith. I never saw, except in Hungaria, unto which I always parallel this countrie, in all our most respects; for everything that is heare, eyther sowne or planted, prospereth far better then in old England."

It is to be regretted that no accurate statements are made of the yield per acre of the various products of the soil. But, judging from these and many similar general statements which the limit of time forbids me to cite, we have every reason to believe they were far beyond the average crops of the present day under like culture. It is true we read of their occasional failure by reason of droughts; and it is certain that droughts occurred then as well as now. But in judging of their frequency and intensity we are to bear in mind that the plowing of early days was the merest scratching of the surface, that little or no retentive manure was used, and that at the present day and under such conditions our crops would prove uniform failures. It is safe to say that, with the advantage of a virgin soil and with the conservation and more uniform distribution of moisture afforded by the forests, our ancestors had good reason for making glowing comparisons with the fertile soils of Europe.

Turn now to the aspect of our State at the present day, and we are compelled to admit a mighty change. We except, with pleasure, the alluvial spots around our cities, which receive special enrichment and high culture. We point to these with pride, as yielding products largely exceeding those of the past. But the fertility of these gardens serves to make the barrenness of the surrounding hills and plains only the more conspicuous.

These outlying fields have been laid bare for a century or more, and subjected to the influences of our clear, hot sun, of sweeping winds, and of washing rains. To a large degree the organic deposit of ages has been exhausted by continued cropping; or dried and blown, or washed, away. So exhausted have many sections become that they are abandoned for tillage and are now neglected pastures, or are left to a straggling and miscellaneous forest growth. It is a well known fact that there are, and have been for years, numerous farms for sale in all parts of the State at a price scarcely

sufficient to cover the value of the buildings connected with them. There is a well understood significance in the term "land-poor," as applied to a man even in this good old Commonwealth, which is so prosperous in commercial and manufacturing enterprises, and furnishes ample markets for all farm products. But the naked truth is that the lands are not productive; the fertility is gone, and to keep them in heart requires about as much expenditure as the value returned by them. Of course it is evident that land will be wanted in the vicinity of our cities and thriving manufacturing centres, both for homesteads and also for cultivation, without regard to the question of profit. And there are special lines, as for example the production of milk, where there is an encouraging prospect of remuneration. Indeed, we may say that, with capital, improved machinery, improved methods, near and excellent markets, and a large amount of energy and brain, most of our farms may be *made* to pay,— still the very statement implies that the lands are now in a low and exhausted state, and are suffering from neglect. The same causes which have operated to change Palestine and other countries of the old world from lands "flowing with milk and honey" to regions of extreme sterility have been, and are now, operating in our own land, and we are sitting by as idle witnesses.

It is, indeed, an ungracious task to report the poverty of the land. But the fact stares us in the face, and it is folly to shut our eyes upon a situation so serious. And especially is this so, if by wise effort it is possible, in a good degree, to ameliorate this condition. It is true we have a long and difficult problem, in attempting to change not only the soil, but also the very climate of a State. But a reversal of the processes which have caused the changes in the past would surely, if followed for a sufficient time, restore the original condition of both. If left in undisturbed possession Nature would, herself, in the course of ages bring back the stately growth of the forests, and restore the pristine richness of the soil. But, obviously, this is not what we seek. No one desires to reduce Massachusetts to the condition of a howling wilderness. What we do desire is to restore a fair balance between field and forest,— to devote certain sections, which are unfit for other purposes, to their own legitimate end.

There are thousands of acres of rough hills and of barren coasts and sandy plains in different parts of the State, which are unfit

for cultivation, and which should be judiciously planted with trees adapted to the situations in which they are placed. Such trees, wisely planted and cared for, would in time yield a better return than could otherwise be obtained from the soil, while at the same time this growth would confer an important benefit upon the surrounding country.

I need not dwell upon the influences of forests. You all recognize their protection as wind-breaks, the fertilizing effect of their shade and annual deposits upon the soil; their power of detaining the rainfall for a slower descent into the streams; their radiation of heat in winter, and absorption of it in summer, and other like beneficent influences. At our last meeting Vice-President Smith mentioned that his thermometer was always a few degrees higher than his neighbors', stating also that there were a few evergreen trees not far away, which he presumed had some modifying effect. In a deep forest we do not need the aid of a thermometer to notice that the modifying effect is very great.

But if the effect of forests is so beneficent, and if, withal, they are profitable, why then are they not more generally planted?

We have time only in the briefest way to state a few prominent reasons.

First. With most land-owners, this is an untried industry; the processes of planting and of culture are unknown; examples of success are wanting.

Second. The danger from forest fires is serious; the risk deters in many cases.

Third. The benefits of forests extend to adjoining regions, but the cost is borne only by the planter.

Fourth. But, chiefly, the spirit of the age is against such long investments.

The main discouragement lies in the last mentioned consideration.

There are a few noteworthy examples of gentlemen of wealth who take pride in the permanent improvement of their estates, and who can well afford to disregard early returns. But these cases are comparatively few. The bulk of our land does not remain in families from generation to generation, like the entailed estates of the old world. The tendency is to make real estate, like all other property, easily transferable and available for present use. Hence an investment which defers adequate returns for a score or

two of years, offers a prospect too remote to be inviting. True, there will be thinnings from the plantation; which may perhaps be taken in eight or ten years. But these will scarcely exceed in value the cost of proper care of the forest. And the average land-owner really cannot afford to await such distant returns, with the constant risk of losses by fire.

There are other discouragements,— such for example as the absence of saw-mills and other machinery for the manufacture of wood; which are not now to be found, because the industry has been abandoned.

Is it then strange that next to nothing is done in forest culture? Can we reasonably hope for any marked progress so long as present conditions exist?

It may be said in reply that we are actually improving; that the number of acres in wood is greater than it was fifty years ago. This is doubtless true. But the very statement rather serves to prove to what an extreme we had drifted. The wood lots which have grown up during the past fifty years have in the main sprung up on wholly neglected lands; very few have come from judicious planting. Many a neglected field, having ceased to yield profitable crops, has been seized by the white birch and other miscellaneous growth; the result being that we are getting a certain kind of increased growth, but one of comparatively little value. There is also an increase of shade trees along our road-sides, and of trees for ornament in the vicinity of our homes, which are a real gain. But the result, taken as a whole, is anything but creditable to the State. And so long as the discouragements continue to be so many and so serious, it is not reasonable to expect any material progress in the restoration of the forests.

But we may not rest here. It becomes us seriously to inquire what can be done to remove or to alleviate these discouragements.

I am persuaded that this is an industry which requires and deserves the fostering care of the government. It is an industry which vitally affects the common weal; which if prosecuted largely would indirectly confer great public benefit yet must be done at private cost,— but cannot thrive without encouragement. Our legislature has recognized these conditions, and has to some extent enacted statutes favoring forest planting. But these laws are meagre in their provisions, and as we have seen have not, thus

far, produced any marked result. We also need stringent statutes respecting forest fires.

Most of our fires are the result of sheer carelessness; some, perhaps, of malice. Strict laws, rigidly enforced, would prevent a large proportion of these. The evil is not confined to the amount of direct loss occasioned by these fires, enormous though this is, but the constant risk is a standing menace against all enterprise in forest culture. Our statutes should afford the amplest possible protection in this respect.*

In addition to this, it is time that our legislatures should consider the expediency of offering bounties for lands devoted systematically to the growth of trees. We now have a statute which, under certain restrictions, exempts from taxation low-priced lands,—lands which are planted to forest. But this is only a negative encouragement, and so trifling in comparison with the conditions imposed that it is doubtful whether it has had any appreciable effect. Another statute, passed in 1882, is intended to encourage cities and towns in the formation of wooded parks, giving authority to take lands and providing for their control by the State Board of Agriculture. Here, again, the aid is meagre and remote, and is not likely to produce any marked results.

On the other hand the offer of even a moderate graded bounty would arrest the attention of farmers, and probably lead to numerous efforts in planting.

And there is surely a warrant for such a subsidy. The whole State is receiving direct benefit from every acre of forest maintained. Whenever these widespread benefits are enhanced by forest planting at individual cost, should not the State contribute its portion? A moderate amount of bounty, it is believed, would prove a sufficient stimulus to arouse our farmers out of their present habit of slovenly neglect.

There remains one other way by which the State could promote the interests of forestry, and that is by example. We are familiar with the extensive work done by European governments in the culture of forests, and the revenues and satisfactory results which follow. So well-recognized is the public welfare involved in forest

*A stringent statute in regard to Forest Fires has since been enacted by the Legislature of Massachusetts, in accordance with a petition presented by a Committee appointed by this Society.

preservation, that private owners of wood are not allowed to cut upon their own lands without government supervision.

The State of New York has recently appointed a Forest Commission, and made other provision for protecting the Adirondack region as the source of supply for the waters of the Hudson, the Mohawk, the Black, and other rivers, upon which the prosperity of the State so essentially depends. Can we doubt the wisdom of such a protective policy?

It is a practical question for Massachusetts to consider how far she can encourage the growth of trees on her western mountain slopes, and on the waste stretches of her eastern coast-range; and also how far she can coöperate with her sister States in protecting the sources of the Merrimac and the Connecticut.

Still nearer to us and of very pressing importance is the question—What is her duty in respect to the Middlesex Fells? Here is a rugged, broken region of four thousand acres, unsuited for cultivation or for building purposes, yet in close proximity to the homes of one-third of the population of the State; a region adapted by nature for a wild forest park, where a large and regular water-supply might be maintained; where, after a very few years, timber might be cut, sufficient in value at least to cover all the cost of maintaining the park; and where, best of all, a noble example might be given of fostering care over an important industry, with proof of the feasibility of forest culture, and of the vast benefit of such wild tracts to the neighboring cities. It is a fact so well recognized that I need not now dwell upon the admirable adaptation of this tract for the purposes indicated. It is a piece of great good fortune that, though in the immediate vicinity of the large cities of Lynn, Boston, Cambridge, Somerville, and Malden, yet, owing to its natural conformation, it remains to this day comparatively unoccupied. And still, though unsuited for ordinary improvement, it cannot long remain in its present condition. Unless secured at an early day it will be invaded by scattering settlers and the opportunity to take it will be gone.

Here then is an enterprise in which the whole State is interested. The State should therefore assume it. But the nearer cities and towns are more largely interested than the more remote portions. The principle of betterment assessments should therefore apply to these neighboring places. But this should not be made a heavy burden. It should be most distinctly and emphati-

cally understood that these Fells are to be in no respect like the adorned parks of most of our cities. Such costly ornamentation would defeat the very purpose of the enterprise. The charm of the place should for all time consist in its simple, rugged naturalness; while, at the same time, many practical lessons in forest culture might there be taught. In how many and varied ways would the influence of such a project be most wholesome,—an honor to the State, and a source of sure and abundant recompense!

In my judgment, Mr. President, the time has come when the Massachusetts Horticultural Society should throw the weight of its active influence in favor of forest laws in general, and of legislation for the Middlesex Fells in particular.

I may add, in closing, that at the last session of the Forestry Congress, two of the members of this Society were appointed, with two gentlemen from each of the other New England States, as a Committee to promote appropriate legislation by these associated States in regard to forests; and that this Committee now holds the subject under consideration.

Discussion.

Francis W. Brewer thanked the Society, in behalf of the American Forestry Congress, for the use of the Society's Hall for the meeting of the Congress, last September, and for other courtesies shown the Congress at that time. He had listened with very great pleasure to Mr. Strong's paper, the subject of which is of great and growing importance—more so than most of us have yet realized. The laws thus far enacted in aid of forestry are wholly insignificant; the laws of Connecticut provide for a bounty of ten cents for each tree at the age of three years, and there are similar laws in Massachusetts. These are worse than none, for they are made an excuse for not passing better laws. It would be much easier to begin anew. Organized action is better than individual effort, and it would be of great service if this society should urge the passage of a law offering a bounty for judiciously planted groves. But pending the improvement of the statutes all who have a bit of waste land should begin planting trees. It is surprising how much land there is in this State of which farmers could make no use so good as by planting with trees. This would allow them to concentrate their labors on better land. A few

days' work in spring and autumn would give them deciduous and evergreen trees which would afford a storehouse of lumber, besides great enjoyment to themselves and their families.

John G. Barker spoke of the loss sustained in the death of Elizur Wright, who was one of the most earnest promoters of the Middlesex Fells project, and who had promised to the Garden Committee (of which the speaker is Chairman) a brief history of the Fells. The Committee were surprised at the beauty and variety of scenery in the Fells, and Mr. Barker endorsed all that the essayist had said in commendation of the project. If set apart as a park it would not take many years to produce timber enough to pay all expenses. We are apt to think it takes a longer time to get returns from tree planting than it really does. Mr. Barker spoke of a recent visit to the estate in Lynn planted by the late Hon. Richard S. Fay not a great many years ago; where the larch trees had to be thinned out, and a great number were sold to the telephone company for poles, and smaller ones were sold for fuel. He was surprised at the returns made in so short a time. He also spoke of a visit to the estate of Major Ben: Perley Poore in West Newbury, by the Garden Committee, who could bear witness to what had been done in restoring a growth of wood to what was once a barren hill. The growth of wood gave evidence that land now unproductive can be made profitable by tree planting. A pond on the top of this hill, which was formerly dry, now always has water in it. In Lynn, where the speaker resides, they have a Forestry Society which was formed with the purpose of purchasing and holding on to natural forests; the society has now not far from a hundred acres, some of which has been donated to it, and in other cases the owners have met the Society generously. These things show that people are becoming aware of the importance of forest planting, and the speaker hoped this society would take part in the movement. In Pine Grove Cemetery, of which he is superintendent, there is a stratum of the best loam under rocks, and it is not much work to remove some of these and plant small trees. Near the cemetery there is a piece of ground producing birches, which if it had been planted fifteen years ago with larches would before now have paid an income over the taxes.

Hon. Marshall P. Wilder commended with all his heart every effort for the planting of forest or other trees. Mr. Strong's essay was a most able and instructive paper, and the speaker approved

of asking for government aid to forest planting. The thought that every farmer could have a little forest of his own, on land now useless, should be impressed on all. He knew a farmer who reserved a portion of his land, which grew up to trees that when of proper age were cut off, and now another growth is coming up. The Hon. William Foster owned a part of the Middlesex Fells, and the project of reserving it as a natural park was a favorite one with him.

H. Weld Fuller said that it is a matter of vital importance that we should have health preserved and homes fit for civilized human beings, and forestry strikes at the very root of the subject. All Europe is alive to the importance of forest planting; in Austria the forest area is increasing. Here, until recently, we have had too many trees, but we are now awakening to the importance of replacing some of those which have been cut off. There is no doubt that some of our waste lands can be made profitable by planting with trees; they are not like annual farm crops, which require continual care. He had himself planted trees which are now six feet in circumference.

O. B. Hadwen, Chairman of the Committee on Publication and Discussion, said that while the committee had endeavored to give a horticultural phase to the programme of these meetings, he knew that the welfare of the State depended largely on the awakening of public interest in the subject discussed today. He had had an opportunity to learn the importance of forest planting, both from others and from his own experience. Forest fires have been a great hindrance to planting trees, especially in the vicinity of towns and cities. They are caused to a great extent by careless boys and men. At present you cannot convict unless you can prove malicious intent, and he wanted the law so amended as to include negligence on the part of persons above twelve or fourteen years of age; and he would like a committee to look into the question whether taxation on forests should not be lessened if owned by persons who have little means of support. Taxes should come from other sources.

The most important forest tree is the White Pine, which is adapted to all soils—on hilltops and in valleys. It grows rapidly, especially with a little encouragement; where liberally treated he has seen a growth of four feet in a year. He would transplant seedlings from the nursery; wild pines are not worth a tenth part

as much. They must be judiciously pruned; it will not do to trim up a young tree too closely, but the limbs should be cut off six inches from the trunk. The stump will then die and can be knocked off the next year; and in this way you will get clear pine, worth from four to six times the value of that from knotty trees, where small limbs have been cut close. The Black Walnut, if pruned, will be of great value. The Chestnut grows well all over the State, and always makes good timber. The Larch is a very useful and rapidly growing tree; the speaker planted some for ornament, and twenty-six years after wanted twenty sticks, to square eight inches by ten and thirty feet long. He could not get them without resorting to his ornamental trees, and so he cut out alternate trees; some of which showed annual rings three-quarters of an inch in thickness. The larch holds its size well, and makes stiff timber which cannot be sprung. There are many other trees that will grow on waste land. Farmers say that tree planting does not pay, but they who plant will see their account in it, and they or their heirs will reap great benefit from it.

Francis H. Appleton said that the present laws in regard to forest fires refer only to malicious or wilful injury, and if the law were made to include fires set carelessly or negligently the judges could use their discretion in regard to young persons brought before them for that offence.

E. W. Wood thought that the statements of the essayist in regard to barren lands were perhaps true. Among the early settlers, the farmers had so much land that they could not cultivate it all. Within the last twenty-five years so much land has grown up to wood, that we have more wooded land now than we had before that time. Then the farmers got an income from old wood lots, but now the wood is largely a new growth. There is not one-fourth part as much wood used for fuel now as there was twenty-five years ago. Then there was not a ton of coal used in the native town of the speaker; now the fires are all of coal. The locomotives were all run with wood then. We are likely to have enough firewood to supply the demand, but not enough timber. Much of the land where it has been recommended to plant forest trees is adapted to apple trees; strong land on rough sidehills is the best in the world for them, and they will bear full crops in ten or twelve years, and bring in quicker returns than forest trees.

Mr. Brewer thought we might be in danger of losing sight of the

fact that the argument is not in favor of cherishing the wild growth, or of producing firewood, but of systematic planting of trees for timber.

C. L. Allen of Garden City, Long Island, said that a friend of his who has a farm on Long Island of two hundred and forty acres, one hundred and forty of which is rough land, unfit for agricultural purposes, thirty or forty years ago cut off all the wood except the chestnut from the latter portion and planted locust; and this is now the most profitable part of the farm. He goes to his wood to get money to pay his taxes; in fact the rough portion of the farm brings in more money annually than the arable land, without labor other than cutting and carting the timber, and without manure. The speaker has on his own farm fifty acres of white sand—as poor as any soil can be—where a former owner planted a portion to ailanthus trees, which are nearly as valuable as the locust, and which will make timber fit for mechanical uses in fifteen years from the time of planting, and yield a large revenue on the investment.

William H. Hills of Plaistow, N. H., said that he was a member of a committee to investigate the effect of forests on the rainfall and the tendency of removing them to produce drought in his State, and it was found that cutting off forests did not affect the rainfall, but did produce drought; the snow melting much more quickly, making the floods greater in the spring, and the rivers lower in summer. In regard to reforesting, if he were a young man, he would like no better speculation than growing and planting seedling forest trees. It is easily done. Nature is constantly doing it. He has planted Scotch Larch and Norway Spruce trees which are now two feet in diameter and are stocking up all his neighbors' pastures. Seedlings can be bought of nurserymen at an exceedingly low rate. One can also easily stock his land with oaks and nut-bearing trees. He has white birches which sprang up from seed as thickly as rye, and are now six feet high. The statutes thus far enacted in New Hampshire to prevent forest fires are of very little value; no one has ever been convicted under them. He lives near the line between New Hampshire and Massachusetts, and many people come over there from the latter State and either wilfully or neligently set fire to the forests, and it is difficult to detect them in the act, but hundreds of acres are burned over. The land is being stripped rapidly by portable saw mills,

and in a few years there will be little heavy timber left. He agreed with Mr. Wood that apple trees are more profitable on side-hills than forest trees, if the soil is suitable.

Professor L. H. Bailey, of the Michigan Agricultural College, said that there is more beauty in the Middlesex Fells than in thousands of acres laid out according to the rules of landscape gardening. People here do not appreciate their good fortune in having such a picturesque place near their own doors. In Michigan, where the land is all arable, less attention has been paid to forest planting than here, and it is almost impossible to make farmers believe in the necessity of preserving trees; but it will be only a few years before timber will be scarce, even there. The sources of rivers and creeks should be protected by preserving the trees and shrubs around them. The land around the Ohio river is flooded every year, and is now not lived on. Dunes and knolls should be planted with trees. The speaker looked to the Eastern States for examples of judicious and beneficial forest planting.

Edmund Hersey said that every one who is in love with Nature will be in love with the subject under discussion. What forests we have may be turned in that direction where they will be of the most value. The object should be, not to raise trees for firewood, but for timber or for ornament, and in both these directions we might make great progress. In cutting wood we often leave the poorest trees, and those of least value for timber, to seed our land; we should pursue the opposite course. We should never cut off all the trees, but should leave enough for seed. If our fathers and grandfathers had done this, we might be reaping the benefit now. Nature grows many trees that are not desirable. If an effort had been made two generations ago to encourage the growth of the chestnut, which is much more desirable than the birch, our woodlands would be much more valuable than they are now. Always save those trees which are most noted for their good qualities.

The subject of the most desirable varieties of fruit was here taken up, and Hon. Marshall P. Wilder spoke in continuation of his remarks on the preceding Saturday. There are many valuable old varieties not now cultivated, and so little known that they might be introduced as new and promising well. He had done well by holding on to a good many old varieties. Among cherries, the Windsor is a new and excellent variety—fully equal in tree

and fruit to the Black Eagle. It originated at Windsor, Canada. Of sixty varieties that the speaker had proved, the Red Jacket is one of the most valuable. The Briton Blackberry (formerly the Ancient Briton) is more hardy than the Dorchester, which he formerly esteemed above all others, exceedingly productive, and should be more generally cultivated. A great object with those who cultivate for market is to produce the fruits that bring the most money. Among pears of this character are the Clapp's Favorite and the Boussock. The former must all be picked by the 20th of August. The latter makes one of the most elegant pear trees; in Belgium, where it originated, there are trees sixty feet high. He begins to pick them the 15th of August, and they yellow up and are all of good quality. The Bartlett may be picked about the first of September. He has a Buffum pear tree which bears a crop of twenty bushels or more; he begins to pick them the 20th of September. The Merriam is exceedingly valuable; he begins to thin these also about the 20th of September. They turn yellow with a brown cheek. Beginning early and picking a part of the fruit before it is fully grown promotes the growth of that which is left. The Bosc is always good and there are never so many in the market as are wanted. The Paradise of Autumn and Hardy are valuable for market. The Anjou, which was introduced here about fifty years ago, succeeds throughout the country, and will be as popular as the Bartlett. The Lawrence and Langelier come in later. These are all valuable for market. The dates given for gathering are before they ripen; all pears ripen better in the house than on the tree.

There has been most astonishing improvement in grapes in our day. His vineyard is in a favorable location, and he has but little mildew. Of black varieties he recommended the Concord, Worden, Wilder, and Barry as kinds which cannot be dispensed with, either for market or by amateurs. Of red grapes the Lindley, Brighton, and Delaware are best; the Lindley is best of all. Of white grapes the Niagara makes a vigorous, healthy vine, and is very productive. The Pocklington always ripens with him. The Duchess is of superior quality; the bunches are large but the berries are small; the vine is vigorous and a little tender, but he always covers it. The Prentiss has disappointed expectation; though the fruit is excellent the vine is not as robust as could be wished. The Jefferson and Lady Washington are a little late;

the latter is a fine, vigorous grower, and such an enormous bearer as to require severe thinning. The time is fast approaching when we shall produce as fine grapes out of doors as under glass.

In strawberries he has to settle down on the Charles Downing, Kentucky, Seth Boyden, Cumberland, and other old varieties. The Jewell is coming into a like estimation; it is one of the most promising new kinds. The Prince is of high flavor and vigorous growth.

Mr. Hills said he was glad to know that the Jewell is so promising. He spoke of the deceptive character of the advertisements of horticultural novelties; new fruits are sold at two dollars per dozen plants, or perhaps two dollars each, and after paying these prices in two or three years you find they are of no value. It is amusing to see the statements, in catalogues, that the accounts of new varieties are accurate. Last winter he crossed a large number of strawberries in the greenhouse; fruit on a pistillate plant is sure to be a cross. Probably he would get nine hundred and ninety-nine not as good as the parents, but he might get one better.

Mr. Wilder said that the seed of cross-fertilized strawberries might be sown immediately, and the fruit could be tested in six months.

Notice was given that on the next Saturday Rev. J. B. Harrison, of Franklin Falls, N. H., would speak on "Forestry."

BUSINESS MEETING.

SATURDAY, January 30, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

Edward L. Beard moved that the Committee on Publication and Discussion be authorized to employ a person to make abstracts of the papers read at the meetings for discussion, on the day when read, and prepare copies in manifold for all the daily papers in the city. The motion was unanimously adopted.

Charles N. Brackett, Chairman of the Committee on Vegetables, announced the decease of George W. Pierce, a member of that

committee, and moved the appointment of a committee to prepare memorial resolutions. The motion was carried, and the chair appointed as that Committee Mr. Brackett, Warren Heustis, and George Hill.

Mr. Brackett also moved the appointment of a committee to nominate a successor to Mr. Pierce; which motion was carried, and William H. Spooner, C. H. B. Breck, and J. D. W. French were appointed as the Committee.

Hon. Marshall P. Wilder moved that a committee be appointed to prepare a memorial of the late Henry P. Kidder. The motion was carried, and H. Weld Fuller, Hon. Marshall P. Wilder and Francis H. Appleton were appointed as the Committee, Mr. Wilder declining to serve as chairman.

William C. Strong moved that a committee be appointed by the President to coöperate with other committees and organizations for the purpose of obtaining more efficient legislation for the planting and protection of forests in Massachusetts, and particularly of the tract known as the Middlesex Fells. The motion was carried, and Charles S. Sargent, William C. Strong, John Robinson, William H. Spooner, and Francis H. Appleton were appointed by the President as the Committee,—Mr. Strong being at his own request excused from serving as chairman.

Adjourned to Saturday, February 6.

MEETING FOR DISCUSSION.

Forestry.

By Rev. J. B. Harrison, Franklin Falls, N. H.

The primary thought, when we consider the formation of a forest, is of a vast sponge of vegetable matter which holds back the water falling upon it, and increases the area of swamp grounds. This condition of the soil formerly prevailed in Great Britain, but great changes have attended the advance of civilization, so that there are few areas of this character left, but instead we have a progressive desiccation.

Likewise in this country, when first settled by white men, forests covered the whole face of the land, and in consequence the streams,

swamps, and springs were much more plentiful and well supplied than now; the forest not only retaining the water like a sponge, but furnishing for the soil a shelter from drying winds and scorching suns. Then trees were regarded as the enemy of man, for they were the great obstacle to his gaining a subsistence; and the forest was cleared and burned with tireless energy, and children were educated to think of it as something to be destroyed. This went on for several generations and the momentum of the same feeling continues, and people instinctively destroy forests, when the necessity for doing so long ago ceased and they ought to preserve instead of destroying them. Here in America we are steadily and rapidly going on to the same catastrophe that has befallen older countries.

There is an unfortunate tendency in the American people to make money in the present, without much regard for future consequences; and so we have gone on, in a careless, selfish belief that if we destroy all the lumber we shall somehow find a way to replace it, until we have come to a point where every intelligent lumberman knows just what supply is left. In a very few years more we shall come to the extinction of the magnificent white pine forests of Michigan and Wisconsin, and then a stop will be put to the settlement of the treeless plains of Dakotah and other territories by people of moderate means, on account of the scarcity of material for building, which will all have to be brought across the Rocky Mountains.

Until recently, no means have been used to diffuse information on this subject, but, depending on our hopeful instincts, we have felt that in America everything is bound to come out about right, and that there is no waste that cannot be supplied. It is true that we can do many things that others cannot, but we must remember that the limitations of human nature exist for us, and that there are some things that cannot be replaced. Animals have become extinct because the conditions under which they lived have passed away.

Within our own time the careless habits of the hunter have made the bison almost extinct, and he can never be restored; and the native forest is disappearing with him. Lands once endowed with extreme fertility, with as fine forests as ever grew, and having important relations to civilization, have, through loss of the forests, become entirely changed in character. In the State of New York vast

regions once fertile have become thus blighted, and now show league after league of rocky, seamed, and scarred desolation, as irrecoverable as the desert of Sahara; and it is now too late to do much towards preserving what remains. We go on cutting timber because it is profitable, and fire soon comes in among the brush and *débris* left, and the soil, being largely composed of vegetable matter, is to a great extent consumed. The first fire makes it easier for the next, and soon there is no soil left on sloping grounds, but it is washed down, choking streams and destroying springs, until the barren waste that remains is a pitiful sight. Saw-mills are deserted, having neither water nor logs to keep them working. There are in the Adirondack region the ruins of many saw-mills where one wonders that a saw-mill should ever have been built. In New Hampshire the water supply is found to fail; and when the cause is inquired into it is found that the springs were at the heads of ravines covered with forests which the farmers cut off, burning the dry rubbish. As a result the surface became disintegrated and too dry for further vegetation, and soon there was the beginning of a vast chasm. Whole farms have thus been destroyed, and the sand creeps over them. There are in that State many plains formerly covered with white pine, but which, since the forest was cut off, have become deserts of shifting sand. People lament this result, but they are responsible for it.

How to prevent this destruction and replace our forests is one of the most important questions of the day. The first step must be to educate the public to a sense of the urgency of the case. There has been much agitation of the subject, and much has been published in the journals of the day; various agricultural and horticultural societies are now debating the subject with interest, and doing much in the right direction,—yet thus far we have not sufficiently protected an acre of forest, or stayed the lumberman's axe at the foot of a single tree. The State of New York has a forestry commission which last year presented to the Legislature three bills designed for the protection and renewal of forests, but it was impossible to persuade politicians of their necessity, and only one was passed, and that was first shorn of its most useful parts. The result was worse than if nothing had been done. One of the members of this commission was a lumberman.

It is a question how far we can depend on the means hitherto used to awaken interest in this subject; probably we have about

reached the limit of what can be done in this way, and other measures must be tried. Older regions of the globe, once fertile, now subsist only a nomadic population; and by continuing the course which has been pursued there we shall arrive at the same result. To prevent this calamity we need first to arouse popular feeling and awake popular attention. We need to compare what is done in various locations. We need a National Forestry Commission, armed with large powers for making experiments and investigations; and composed, not of politicians who will make it a source of scandal, but of men who will devote themselves to the study of the subject, and prepare measures for the action of Congress, presenting a comprehensive plan for the management of National and State forest lands. We need a change in the temper and spirit of the people, and in bringing this about we have a vast educational work before us.

We need a National School of Forestry, with ample resources, where young men shall be educated in all the various methods used abroad, and taught how to apply them here, so that they shall be qualified to manage forests in every part of our country—such a school as shall make its pupils feel that they have a career before them, as much as if educated at the military school at West Point, or the naval school at Annapolis; for the objects of a school of Forestry would be quite as important as those of the others. Such schools exist in European countries, though yet unknown here because their necessity is not yet perceived; but we shall have to modify our ideas to suit the changed conditions of our times. Before much can be done in protecting forests, the average American will need a good deal of instruction in regard to the importance and necessity of surrendering some of his private rights for the public good. We need a periodical to discuss the subject of forestry, which shall be devoted to persistent education of the people, not by elaborate æsthetic essays but by short, sharp, and incisive articles, with iteration and reiteration. What we are doing now is far from being adequate to the necessity of the case, and we must be prepared to do a great deal more, or to give up altogether.

In connection with the protection of forests, thought should be taken for the promotion of the higher landscape gardening — the highest art that we have anything to do with in this country. The genius which produces great pictures and statues is worthy of ad-

miration and respect, but there is no higher work of art than that done by the man who takes a tract of wild, unfertile ground, and forms in his mind a picture of what may be made of it in fifty or a hundred years, and works to realize that ideal—patiently laying the foundation of what he will never see completed. Such men we have here now; there is one in the employ of the City of Boston.

All our problems are complicated, and we must recognize the fact that our environment is peculiar, and we must educate the people to recognize it. They must realize that private interests are not the highest objects. We might make attractive forest places near the cities, preserving the sources of water. Here in Boston, is the fittest place for a journal devoted to this work. No method of prosecuting it can be completely adequate which does not include and provide for an advance in civilization.

Discussion.

William C. Strong fully agreed with the previous speaker as to the importance of the subject so eloquently presented by him. The time for talk has passed, and it is time for our own State to take action. Our statutes are inadequate; they profess to encourage forestry, but do not. Low priced land is exempted from taxation if planted with trees, but not a tree has been planted as the result of this exemption. Our present laws on this subject are so meagre and scattered that no one can tell much about them, and they should all be repealed; and a code should be enacted giving effectual encouragement to forest planting, and more effectually preventing forest fires.

Francis W. Brewer thanked the Society for devoting two meetings to the subject of Forestry, which is now becoming recognized as of vast importance to all classes of people. But, however able may be our essays and discussions, the wave of progress set in motion by them soon dies out without further work. All who see the importance of the subject should be prepared to act intelligently, for the impetus given will not perpetuate itself. He believed that such a committee as was proposed would be most useful, and it would have the more weight from combining its action with that of other organizations. The Committee of two from each of the New England States, appointed by the American Forestry Con-

gress to draft laws in relation to forestry, will prepare a draft founded on the latest and most progressive legislation for its encouragement, and legislators will be glad to have an agreement in regard to such legislation on the part of those who ask for it.

Notice was given that on the next Saturday William E. Endicott would read a paper on "Gladioli."

BUSINESS MEETING.

SATURDAY, February 6, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The Annual Report of the Treasurer was read by the Secretary, accepted, and ordered to be placed on file.

John B. Moore presented the following preamble and resolve:—

Whereas, The report of the Treasurer shows that there are in his hands bonds to the amount of twenty thousand dollars, held by the Society as an investment of surplus funds; and

Whereas, There is a debt of the Society represented by a mortgage upon its real estate, the principal sum of which falls due within three years:

Therefore, it is *Resolved*, That the amount of funds in the treasury, now represented by the before-mentioned bonds, be made *a sinking fund*, to apply upon the payment of the mortgage debt when due, and to be placed in the hands of the Finance Committee as trustees for the purpose aforesaid.

The motion was referred to the Finance Committee.

H. Weld Fuller, Chairman of the Committee appointed at the last meeting to prepare a memorial of the late Henry P. Kidder, presented the following report:

A few days ago, the death of our distinguished and honorable associate, Mr. Henry P. Kidder, was announced, and on every hand the evidences of deep sorrow and affliction have appeared. He was well known to the community as a genial, generous, and

philanthropic citizen, and for nearly a quarter of a century he was a valued member of this Society. We cannot, therefore, permit this occasion to pass without placing on record some expression of our appreciation of his virtues, and our high respect for his character and memory. Whereupon, it is

Resolved, That this Society is deeply sensible of the great loss which we, in common with many other associations and the public, have sustained by Mr. Kidder's decease. His sound judgment, sagacious counsels, expansive benevolence, and hearty coöperation in whatever tended to elevate, purify, or gladden the lives or homes of the people were recognized and appreciated by all who knew him. Whoever would protect the young, or improve their habits, tastes, or condition, found in him a willing helper. Gratefully recognizing the goodness and bounty of God, he gave freely to His cause, and contributed to spread the beauties of His floral kingdom for the enjoyment of all.

Many who experienced his kindness will long cherish his memory; and, like us, will plant his honored name upon their hearts, and surround it with ever-growing "Forget-me-nots."

Resolved, That these resolutions be placed on record, and that a copy be transmitted to the family of the deceased, with the assurance of our warm sympathy in their great affliction.

H. Weld Fuller,
Marshall P. Wilder,
Francis H. Appleton,
} *Committee.*

Mr. Fuller added that the time would not be misspent if he said one word more. It is due to ourselves that some notice should be taken of the departure of Mr. Kidder, as an incentive to the young to follow his example. He was known as a man of generosity, and an almoner of the bounty of God. Doubtless he was such in many instances unknown to us.

Hon. Marshall P. Wilder affirmed the truth of all that was said in the resolutions in eulogy of Mr. Kidder. He knew him from a very young man, and he was always modest, genial, and unpretending, with a heart full of desire to promote the best interests of the community.

The resolutions were unanimously adopted by a rising vote.

The following named persons, having been recommended by the

Executive Committee for membership in the Society, were on ballot duly elected:

Oliver R. Robbins, of Weston.
Stephen P. Sharples, of Cambridge.
Jacob Hittinger, of Belmont.
Francis W. Brewer, of Hingham.

Adjourned to Saturday, February 13.

MEETING FOR DISCUSSION.

The Gladiolus.

By William E. Endicott, Canton.

The genus *Gladiolus* as defined in the "Genera Plantarum" contains about ninety species; found for the most part in South Africa, though a few species exist as far north as the equator, and a few others are natives of Southern and Central Europe.

The varieties which are so conspicuously ornamental in our gardens in August and September are the progeny of three or four of the South African kinds, hybridized with each other; the hybrids being crossed among themselves so extensively that the sorts now in existence must be over three thousand in number. The first hybrid sort, said to have been the offspring of *G. psittacinus* and *G. cardinalis*, was raised in Ghent and was therefore named *G. Gandavensis;* and the great bulk of the varieties since raised are called "Gandavensis Hybrids."

It is unnecessary for me to dwell upon the beauty of this flower as it now exists, upon its excellence for purposes of decoration, upon the length of time a cut spike will last, etc. I will pass on at once to a consideration of the modes of cultivation and propagation; premising that I shall describe only the methods which I have found satisfactory in my own practice, and that I am quite ready to believe an equal success may be attained in other ways.

The bulbs—horticulturally speaking we may call them so, though botanically they are *corms*—may be planted as soon as the frost is well out of the ground,—say by the 15th of April, in light soil with a good exposure, if the planter prefers to do it at that time: still there is nothing to be gained by doing it so early, for though the plants will be perfectly healthy their progress will be very slow

until the soil is well warmed, and the flowers will not open earlier than if planting had been deferred for a month. Unless the month of May is likely to be so taken up that time cannot then be spared, I should not advise April planting. My own practice is to plant between the tenth and fifteenth of May.

The best soil for the gladiolus is a well drained loam, better light than heavy, for I have observed that where the rows have extended into moist land the bulbs there planted have neither blossomed nor grown as well as they should have done; and that the bulbs have been smaller when taken up than they were when planted. The plants will not be likely to suffer from dry weather, however light the soil may be. Three years ago the drought was of unprecedented severity in Canton, so that from about five hundred plants of dahlias I had only one flower, but the gladioli, growing in the same field, bloomed as well as ever. The soil, whatever its nature, must be well loosened and pulverized if the best results are to be attained. I used formerly to grow a few gladioli in my flower garden, where the only way of loosening the earth was by the spade or digging fork, but I soon found that they were far behind those planted in ploughed land; so that now all are grown side by side with corn and potatoes and please me much better than they ever did before.

The fertilizer I have found best is that sold by the Bowker Company for root crops. The furrows having been made with the plow, thirty inches apart, the fertilizer is sprinkled therein at the rate of a gill to about twelve feet of the row. I use none at all except in the row, because I do not believe that the roots extend more than five inches in each direction. The bulbs are put as nearly four inches apart as I can easily do it. I drop them from a basket or a box as I walk along the row, there being no need of stooping to put them in place because, the earth being soft and loose, they stay where they strike, and seldom roll. It makes no difference how they lie. I have examined the subject carefully by experiment, and find that if the bulbs are laid with their tops down and the base up they will come up as soon, blossom as well, and make as good bulbs for next year's planting as if they had been placed with the tops uppermost. It is very fortunate that such is the case, for it would be a most irksome task to plant a large number if each had to be carefully put in place; whereas it is easily done by taking a half-bushel basket full on one arm and dropping them with the other hand as you walk along.

Those who grow them for sale, having thousands of a kind, perhaps, cover them with the plough; but where there are few of a kind it is better to use the hoe, as the plough would be likely to displace the labels with which the several kinds should be marked. If the soil be not extremely light the bulbs should be covered only four inches. A week after planting the whole ground should be hoed lightly or raked; this will destroy a host of just sprouting weeds and will not interfere with the growing shoots, which in a week more will appear above ground, and will grow enough better to pay for the extra hoeing. The after cultivation is much like that of any other crop, and may be summed up in three sentences, "Keep the ground loose; Keep the weeds down; Draw an inch of soil to the plants." The last operation is designed to give the plants greater firmness to resist wind and rain, which are so apt to beat them down when in blossom.

Few flowers will appear before the tenth of August, but for eight weeks from that time you will have a brilliant display if you have as many bulbs as you ought to have and can have at a very small expense.

It is very interesting to observe the different habit of growth in different kinds. Some will have bright green foliage, others bluish or grayish or yellowish green; some kinds have it narrow, others broad; in some it is erect, in others fan-like, in others drooping; some kinds bloom early, others late. With me, a crimson sort called *Couranti fulgens* is invariably the first to blossom.

If you have many bulbs it is useless to try to support the flower stalks in any way. If you are determined to do it, you can drive a few stakes and stretch a wire along, to which to tie the stalks; but it is better to cut such as are top-heavy. In the future, possibly, no gladióli will be grown which are not rigid enough to resist wind and rain. It is a good plan to prevent the maturing of seed except when you want it for sowing; both because seed bearing is always exhausting, and because if the stalks be cut off as the flowers fade the rows will have a neater and more pleasing appearance.

When the frosty nights begin no more flowers will open, and it will be time to think of taking up the bulbs. We read a great deal in the English gardening journals of the importance of letting the plants stand until the tops shall have died down. Not only is there no need of this, but doing it will increase the labor of

"lifting" fully eight-fold; for instead of having a good handle to each bulb you will have to grope about in the soil to find it. My plan of "lifting" is to have a man go along the rows with a spade, thrusting it in under the bulbs; not raising them out of the ground, but only loosening the soil. I follow, taking the stalks in my hand, as many as I can grasp, pulling up the plants, to which very little earth will adhere, and leaving each kind by itself with its label near it.

This labor is very light, for me at least, and the task is quickly done. The stalks are cut off the same day, as closely as possible to the bulbs; which are then gathered up in boxes and put into a place out of reach of the frost, where they stay until December, when the dry roots, the old withered bulbs, and the bulblets, are taken off; the clean bulbs are then removed to my cellar, where they remain until the tenth of May comes again. As I aim to lift the bulbs as near the tenth of October as possible, it will be seen that they are out of the ground seven months in every year.

Propagation.—There are three ways of propagating the gladiolus in its special varieties, and one way of raising new kinds. The first way to be mentioned is merely a curiosity of propagation, and of no practical use. The flower stalks of most kinds have a leaf on the lower end,—if the stalk be cut below the leaf and inserted into moist sand, a small bulb will usually be formed in the axil of the leaf.

A second way is by cutting the bulb into pieces. If a bulb be stripped of its husks, there will usually be found two large buds at the top and smaller ones in a line down each side. Just as every bud of a grape vine may be made into an independent plant, so every bud of a gladiolus bulb may be made to grow, and form a bulb. Some of the buds are double or triple and will make two or three bulbs. Nevertheless it takes so much care and attention to make the smaller buds start that, practically, it is not advisable to cut a bulb into more than two pieces. Care must be taken in peeling the bulb not to break off such shoots as may already have started. If the bulb be left uncut, it is not often that more than one bud will grow, though some kinds will increase very rapidly without cutting. The two species *psittacinus* and *dracocephalus* will usually yield three or four bulbs for every one planted.

The only way of propagation, however, that can be called rapid,

is by the little bulblets, or "spawn," which form about the base of the large bulbs. These will start readily enough in the spring if the hard covering be peeled off, or if it be simply cracked by pressure between the fingers.

New kinds, of course, are only to be had by raising seedlings; which every one who gardens for pleasure ought to do. Unless some special object be aimed at, good results will be obtained by using the seed of any good sort. Most who raise seedlings, however, will prefer to cross the best kinds only—at any rate the seed of poor kinds ought never to be used. If you prefer to use seed of your own growing, you will find the latter part of the day better than the morning for the purpose of cross-fertilizing your flowers, for the pollen then is dryer though less abundant. As the instrument, I think a wooden toothpick, cut to a wedge-shaped end, is better than a camel's hair brush. The three parted stigma should be operated upon when spread partly open, but not too broadly. It is well to protect in some way the flower fertilized from the visits of bees and humming-birds, which are usually busy the whole day among the blossoms.

In Rand's treatise on bulbs, full directions are given for raising seedlings,—directions which should be studiously disregarded. The seed should be sown in boxes or seed pans, about the first of January. As much of it will be poor and as the true seed is very small in comparison with the broad flake which contains it, it may be sown so thickly as to cover the surface of the soil. One-fourth of an inch of covering will be enough. In about twenty days the seedlings will be up, and must be kept clear of weeds and grass. They will grow until October; and the boxes or pans should then be put away in some perfectly dry place. The seedling bulbs will be found to be from the size of a pea to that of an acorn, and are to be put into the open ground at the next planting time. A large part of them will blossom before frost.

Nothing in the whole art of horticulture yields more pleasure than raising seedlings; and, although the poor ones will outnumber the good ones many times over, the latter will more than repay the trouble.

As for the gladiolus disease, of which we hear so much, I know nothing of it. I have never seen it, though I have had a very large number of bulbs for many years. The only insect that is at all troublesome is a black, soft-bodied one that eats the blos-

soms. It is the same that is found on golden-rod, and that is so destructive to asters. It prefers the light flowers; and is a nuisance for a little while, but is soon gone.

Slightly altering the words of an old writer, I may say—"All your labor, past and to come, about a collection of gladioli is lost unless you label well." It is impossible to keep up a collection without labels. I have sometimes given my neighbors collections of gladioli with labels and been told—"I don't care for the names if the flowers are good." From year to year they have saved the largest bulbs for the next year's planting, and, as the largest bulbs are always those of one or two sorts, I have been frequently told that the bulbs had degenerated, and that most of the kinds had changed, so that they were now of only one or two kinds.

The best way of labelling that I have found is to have strips of zinc five inches long by an inch wide. On these the names are written, and by means of a wire the labels are fastened to cedar sticks fourteen inches long and two thick. The reason for having labels and sticks so large is that there is danger that a careless man might displace a smaller one, with hoe or cultivator. The boxes in which I keep my bulbs are long enough to hold the label, stick and all, so that, with two hundred and thirty named sorts, the trouble of keeping them true to name is very trifling. Another safeguard against confusion is to make a list of the kinds, in the order in which they were planted. This ought to be done as soon as planting is over.

Some years ago when *G. purpureo-auratus* was exhibited here, Mr. Spooner, for the Flower Committee, remarked that although it was not very striking in itself, it might be of great use in hybridizing. The event has remarkably fulfilled his prediction, for by using this species a new strain has been produced of a brilliancy and beauty equal to those of the *Gandavensis* tribe, while yet very different in aspect. Lemoine was the first to introduce these hybrids to the public, and they are frequently called after him the "Lemoinei strain." As yet, few of these make a fine spike, their beauty lying chiefly in the individual flowers.

I am sometimes asked whether these hybrids are really hardy as stated. The question cannot be answered in one word. One parent, *purpureo-auratus*, is perfectly hardy, and I have seen it naturalized in mowing-fields; the other parent, *Gandavensis*, is not

hardy, though a bulb or two will frequently live through a favorable winter. Their offspring partake of the nature of both, and are hardy or not according to the predominancy of one or the other parent; but, while many are hardy enough to survive the winter, not one will bloom if left out one-half as well as if taken up in autumn.

There are many other species of which I should like to speak, were this paper not already so long. I hope they will be noticed in the discussion.

The gladiolus is not as much grown as it ought to be. Few people, comparatively, know anything of the finer sorts, and I have been told, upon excellent authority, that there is very little sale for named kinds. It is not unusual to find in catalogues the statement that excellence and high price do not necessarily go together; that some of the cheapest are as good as some of the dearest. There can be but little incentive under such circumstances, to buy high-priced bulbs; this is one obstacle to the expansion of gladiolus culture. Another is in the prices themselves. Although novelties, if they are really fine, may properly be set at a high rate, there seems no good reason for putting old kinds at $3, $2, or $1. It is a pity that some dealer could not make a beginning in this matter by pricing them according to their excellence and not putting them too high. This, however, is a matter beyond my province; it is likely that good reasons for the present practice exist. Another unfavorable circumstance is that people will not buy small bulbs, though some of the best kinds never make large ones.

I have heard the remark made that no further progress with this flower seems likely—an ill-considered statement. We have not a single really good yellow yet; all are defaced with dull purple stains. There is then a whole series in prospect, ranging from sulphur to orange, not one of which is yet attained. Then in the dark shades not much has been done; though probably we may yet see a gladiolus as dark as a black pansy. New and odd styles of coloring may yet be obtained: I have had one or two hints among my own seedlings. For instance, a flower came last year which was grained all over with yellow on a red ground—an unpleasing combination; but a white ground similarly grained with scarlet would be fine indeed. Another flower consisted of three scarlet and three pure white petals placed alternately;—a striking

flower, but too violently so to be altogether pleasing. But these are hints only and show that new things are yet in store. I do not think it impossible that we may yet have blue ones. Improvement may also be looked for in length of spike. Shakspeare and Meyerbeer are perfect in form but not long enough in spike; some of the newer kinds have twelve or fourteen flowers open at once, and we should not be satisfied until flowers are produced of such substance that the first shall still be good when the twentieth opens.

There is no use in winding up with a select list of kinds; two persons lately gave lists of the best twenty-four: only one appeared in both lists. There are too many kinds for any one to name the best twelve or twenty-four. Nevertheless it may not be out of place to name a few that are undoubtedly of excellent quality, though others may be better.

Meyerbeer.—Brilliant orange scarlet with darker blotch; perfect shape.

Shakspeare.—White, flamed rosy-pink with deep rose blotch. This flower is thick and waxy, and of unsurpassed shape.

If these two varieties made longer spikes I think they would stand at the head of all known kinds.

Bernard de Jussieu.—Does not usually make a good spike, but the cherry-purple flowers have a tint of blue which makes the variety distinct and desirable.

Citrinus.—The best of the many yellows I have tried.

Colbert.—Deep cherry with white stain on the lower petals.

Condé.—Much resembling Meyerbeer, but lighter and a little larger.

Jupiter.—Tall spike of dark red flowers flamed with mahogany brown.

Mary Stuart.—Old but not yet surpassed among white-and-rose varieties.

Milton.—Very fine, with thick, waxy petals; white marbled with rose.

Norma.—White, tinged with lilac.

Rebecca.—A tall spike with large flowers; pure white, with carmine feathering on the lower petals.

Vivien.—Very much like Rebecca but with thicker petals, and therefore a little better.

Schiller.—A Shakspeare with creamy yellow ground.

Talisman.—A very fine kind, making a tall spike of flowers which are cherry, bordering on violet, and with a white throat.

Thomas Methven.—The most vigorous sort I have seen. Flowers reddish purple with white throat. The whole flower has a bluish cast.

Sir Brasidas.—Very light salmon throughout; wholly unmarked. The only one of its color.

Baroness Burdett-Coutts.—Very large and fine; rosy lilac.

Ball of Fire.—Well-named, being of the most vivid, glowing crimson imaginable.

Africaine.—Deep, dull crimson marked with white; peculiar and striking.

Victory.—A low-growing sort; intense crimson flamed with black.

Jordanus.—A tall-growing kind; color, a soft crimson. This has sometimes fifteen flowers open at once on the same spike.

Abricot.—Very large flower, apricot color, slightly tinged lilac.

Col. Benton.—Brilliant scarlet and golden yellow,—a very fine showy sort, which always attracts attention.

The variety which took the first prize for a single spike last year, Ambroise Verschaffelt, is an old kind which may be bought for fifteen cents.

Discussion.

William H. Spooner said that about twenty-five years ago he grew twenty-five thousand bulbs of *Gladiolus Brenchleyensis;* which produces an enormous number of bulblets, thereby increasing very rapidly. He supplied seedsmen and florists; and this perhaps led to the growth of a taste for the cultivation of the gladiolus in this country. He succeeded in producing many fine kinds by hybridizing; in doing this he found it necessary to cover the flowers with gauze, to keep out bees and humming birds. The species *purpureo-auratus* will yet be the parent of new and novel kinds. Mad. Vilmorin produces enormous bulbs—as large as turnips. He gave up raising gladioli on account of the rust.

Professor Wolcott Gibbs spoke of the possibility of producing hybrids with *Gladiolus papilio*, which is a native of South Africa or Abyssinia. It is closely allied to *G. purpureo-auratus*, and he thought it might give us a new strain. There is too much sameness in the hybrids of *G. purpureo-auratus*; they all have a dull purple tint, and brighter colors are wanted. There has been no

great advance in these hybrids since Lemoine began. The best yellow gladiolus is Pactole, and the best white is Diamant. At Newport, R. I., where Professor Gibbs cultivates his gladioli, the autumn continues two weeks later than at Cambridge, and although it is cooler early frosts are rare.

Mr. Endicott said it is true that the hybrids of *purpureo-auratus* do have a good deal of purple, but it is possible to get brilliant colors. *G. Gandavensis* is not likely to cross-breed with *purpureo-auratus* without assistance. *G. dracocephalus* never makes any pollen whatever in his grounds.

Robert T. Jackson said that he had a few bulbs of *G. dracocephalus* which grew to enormous size; he had one six feet high. The colors are very fine and show the possibilities of better; there are blood red, light red, black, bright yellow, and silvery. The bulbs of hybrids increase with great rapidity, and he has had four spikes of flowers from one bulb. The kinds which increase rapidly are more desirable than those which do not, and gardeners should note which they are.

Mr. Endicott said that the bulbs can be cut into as many pieces as they show eyes, either at the time of planting or earlier, without danger of rotting. If cut with the spade in lifting they will keep through the winter. He keeps them in boxes in an ordinary cellar; any cellar where potatoes keep well will answer; it should not be too damp, nor too dry. In Christmas week he has found his boxes half full of water; he turned off the water and dried the bulbs for convenience, but they do not need careful coddling, and these grew perfectly well in spite of the soaking.

Some of the species are excellent pot plants for winter or early spring flowering; they should be potted in October or November, and grown, slowly at first, in a cool greenhouse. *G. ramosus* and *G. ringens* are eligible for this purpose. The *ramosus* section never flowers but once if pot-grown. *G. nanus* has the *trimaculatus* blood. *G. papilio* is extremely beautiful as a pot plant. *G. ringens* grows from twelve to fifteen inches high and has round foliage; the flower is blue and very small. *G. tristis* if planted in October will flower in April; it is very fragrant part of the day; it was crossed with *G. Gandavensis* by Herbert. *G. Milleri* is light yellow. *G. segetum* and *G. Byzantinus* are hardy and flower best when left in the ground; if potted they grow to a certain height and then rot. The Ghent varieties are not good to force in pots,

but can be forced in a bed of earth, and can be left in the greenhouse year after year. Forcing *G. Colvillii albus* or The Bride has not been successful, but a neighbor of the speaker has been giving them strong bottom heat from the beginning and his are looking well.* *G. nanus* should not be forced to flower too early—May or June is early enough. Mr. Charles A. Putnam has been successful with this species by planting in raised beds, in the autumn, — the flowers appearing in June. *G. carneus* succeeds under the same treatment.

Edward L. Beard said that his experience with *G. Colvillii* has been the same as Mr. Putnam's, who has grown it as a hardy bulb; it is not satisfactory to force, but succeeds in the open ground if lifted after flowering and before making a second growth. The same treatment is applicable to Ixias and other Cape bulbs, which require a period of rest. They sometimes grow a foot high before frost, and this is the critical period; to prevent this they should be dug up as soon as the foliage begins to decay and kept dry and planted again before the ground freezes, thus giving a season of enforced rest, which is what this class of bulbs wants. The speaker has from five to seven hundred bulbs of *Gladiolus Colvillii* in a heavy soil. Mr. Putnam's soil is light and he has wintered Ixias and similar bulbs successfully.

Gladioli will not succeed permanently in heavy soils; they will lack vigor and will not perpetuate themselves; they like a light soil well cultivated. The large English growers alternate them with potatoes. He approved the essayist's plan of ploughing; and would let the ground rest in winter. *G. purpureo-auratus* reproduces itself freely and is very ornamental in the open ground. They multiply freely by bulblets,—sometimes twenty-five from one bulb, and should be grown in quantity instead of pelargoniums, coleuses, etc. Many English varieties are very uncertain in our climate, being feeble and lacking in vigor. He would like a list based on the vigor, strength, and freedom of multiplication of the varieties.

Such varieties as *Colvillii* if ready for planting when received would be injured by keeping out of the ground. They will make shoots an inch or two in length in winter. He covers all his bulbs with about six inches of well rotted manure in winter. The best protection is that which will shed water, which is very destructive;

* These all failed to flower.

—as is shown by the success of Mr. Putnam, whose ground is sloping and well drained so that water never stands on it. *Lilium auratum* needs the same soil.

Mr. Endicott said he gave his gladioli plenty of room, so as to run a cultivator between them, but they can be planted more closely. He had seen Brenchleyensis only four inches apart, and the bulbs apparently must almost have touched each other. Those who will take the pains can have a great number in a very small space. They will grow well at a distance of three by six inches apart; but it is more trouble to take care of them than where they have plenty of room. If his space were limited he would plant them closely.

Hon. Marshall P. Wilder spoke of the practical and sensible character of the essay. The *Gladiolus Natalensis* was introduced here more than fifty years ago, and a colored plate of it was published by C. M. Hovey in 1834 in the first volume of his magazine. In considering the improvement of the gladiolus, hybridizing appears in a very favorable light; we see that it opens a boundless field. It may be applied to every family of vegetables. He could remember when not a tree pæony had a shade of red in it, when all at once came Elizabetha, for which he paid about three hundred francs. There is no end to variety when the species once "breaks," and we may get a blue gladiolus. He would not be surprised if some of those present should live to see a blue rose. Professor Gray was not surprised when the speaker told him of his success in crossing the *Lilium lancifolium* with *Gloriosa superba*. He had seen a statement in the "Gardeners' Chronicle" that the strawberry and raspberry had been crossed; he could not credit it, but it might be possible for all that. The blackberry has been crossed with the raspberry. Mr. Wilder concluded by urging those present to go on in crossing fruits and flowers, and they would produce varieties which would cause their names to be remembered with gratitude.

O. B. Hadwen said that the essay was most satisfactory and instructive. The gladiolus will keep a long time in water in the house; he had kept them good two weeks, and over; when starting on a journey he put a vase of gladioli in the car, and at the end of the journey, which lasted twelve days, the flowers were in good condition. Its colors are fine and happily blended. He had indulged in cultivating a large number of varieties, and had

now come to a point where he was willing to weed out; twenty-five varieties would satisfy him. He mentioned the following twelve kinds as having been satisfactory in his garden:

Africaine.	Jupiter.
Baroness Burdett-Coutts.	La Perle.
Celimene.	La Vésuve.
De Lesseps.	Mary Stuart.
Eugene Scribe.	Meyerbeer.
Horace Vernet.	Shakspeare.

John B. Moore spoke of the importance, in crossing gladioli, of strong robust kinds that do not grow high but will support themselves, so as to bring about a change in habit similar to that which has been produced in phloxes. The finest growth of gladioli that he ever saw was on Cape Cod; he dug down to see what they had to feed on, and found them heavily manured with decomposed cow dung. He would depend on that, but if he used phosphate would want more than a gill to twelve feet of a row. Others might not start with so good land as the essayist, and the plants must have food. He did not approve the essayist's plan of dropping, though it might answer, but it is difficult to drop them six inches apart, and it would not be much more work to throw them in hap-hazard and then place them regularly. He had pursued this method in planting seed onions, of which he had raised acres, and found that if turned on one side they will grope round before growing up. He likes to see straight rows, and the cultivator or weeding hoe can be run much nearer to the plants.

Mr. Endicott said that he had used even less than a gill of fertilizer to twelve feet, and the plants did very well. In his method of planting they are in tolerably straight rows, though he did not say it is the best way. He thought it not fair to compare the gladiolus with the phlox, which makes a spreading head that you must look down upon, while the gladiolus looks straight at you.

Mr. Wilder here introduced to the meeting the Hon. James Grinnell, a member of the State Board of Agriculture, who was deputed by the Board to attend the exhibitions of the Society during the past year. Mr. Grinnell said that his own operations had not been so much in the way of cultivating those things which beautify life as those which are useful. It was a pleasure to him

to be appointed to represent the Board at the exhibitions of the Society; he made his report to the Board the day before, and he could not find language to say more in it than he did, and truth would not allow him to say less. He regarded the Massachusetts Horticultural Society as the most important institution of the kind in the country, and these meetings as the best source of information on the subjects discussed.

Mr. Jackson said his experience had been that it is easier to hybridize species of gladioli than to cross the Gandavensis varieties. He plants in rows a foot apart and six inches apart in the row, four rows forming a bed, with a space of thirty inches between the beds. He uses cow manure, but had found hen manure to give a very vigorous growth. He had seen Mr. Endicott's rows, and they were very straight, and the plants were tall, with magnificent spikes.

Mr. Spooner said that he had found hen manure apt to produce warty roots on roses. The Richard Cœur de Lion and Mary Stuart are admirable hybrid gladioli.

Mr. Jackson had found no injurious results from hen manure, but he would mix it with the soil more carefully than other manures.

Mr. Moore said that hen manure agreed with his roses.

John G. Barker said that if fifty or a hundred gladioli were planted quite thickly in a bed, and the ground between carpeted with mignonette or sweet alyssum, it would produce a very pleasing effect, and for small gardens such an arrangement would be preferable to coleuses, etc. Edward S. Rand, Jr. had excellent success in cultivating gladioli at Glen Ridge, where the soil was quite sandy; he used plenty of decomposed barn-yard manure. He had a row of Gandavensis varieties in the vine border, which were left there when it was covered with manure in autumn, and when uncovered they were found to be uninjured.

Notice was given that the paper for the next Saturday would be on "Bulbs and Tubers for Outdoor Culture," by Mrs. T. L. Nelson, the subject being partially a continuation of that of today.

BUSINESS MEETING.

SATURDAY, February 13, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, President WALCOTT in the chair.

William C. Strong, from the Committee appointed January 30 to obtain more efficient legislation for the planting and protection of forests in Massachusetts, submitted the draft of an act for the prevention of forest fires, and the following vote:

Voted, That the Massachusetts Horticultural Society approves of the proposed act entitled "An Act for the Protection of the Forests of the Commonwealth," as presented by its Committee, and directs the Committee to urge the passage of the same.

The vote was unanimously passed.

Charles N. Brackett, Chairman of the Committee appointed on the 30th of January to prepare a memorial of George W. Pierce, reported as follows:—

The Committee on resolutions in memory of George W. Pierce, report the following:

Whereas, It has pleased the All-wise Disposer of events to remove from us, by death, our fellow-member and associate, George W. Pierce, therefore —

Resolved, That we thereby sustain the loss of one of our most useful and respected members, whose interest in this Society and its objects was deep and abiding; one who, as a member of Committees, has for many years rendered it valuable service, and discharged his duties with promptness and fidelity; and one for whom his fellow-citizens testified their confidence and esteem, by frequently calling him to positions of honor and trust.

Resolved, That as a testimonial of respect for our deceased friend and co-laborer we desire to record our appreciation of his worth; and that we shall always miss his valued counsel, kindly words, and cheerful, whole-hearted work in our midst; and that it will be our privilege to cherish the memory of one who by his genial nature, courtesy, and social qualities won the respect of those whose privilege it was to associate with him.

Resolved, That the above resolutions be entered on our records,

and that the Secretary be requested to transmit a copy of the same to the family of the deceased, as an expression of sympathy in their afflictive bereavement.

C. N. Brackett,
Warren Heustis,
George Hill,
} *Committee.*

The resolutions were unanimously passed.

Adjourned to Saturday, February 20.

MEETING FOR DISCUSSION.

Bulbs and Tubers for Out-door Culture.

By Mrs. T. L. Nelson, Worcester.

Again it has pleased you to ask me to open the day's discussion; whether you have chosen wisely the result must decide. As I recall the instructive discussions that have been here conducted, I am anxious rather to listen to your words of wisdom and experience; and can only hope that what I am able to offer may serve by way of suggestion to set your thoughts in motion. A small body dislodged from the mountain side causes the avalanche. It may be that I shall advance some idea which will open the way for and serve to start an avalanche of wisdom.

One who did not know the enormous will-power and energy of the people of New England might wonder why such lovers of fruits and flowers do not seek a more genial climate. But the same spirit which brought their forefathers here bids them cling to the land of their ancestors' adoption. The frigid winters and scorching summers sometimes dishearten, but do not entirely discourage. True as the needle to the pole, the New Englander gathers up what is left from their ravages, and patiently as he can (for there is a limit to human serenity) repairs damages, replaces winter-killed plants, protects from the severe rays of the sun, and leaves the result, as he must, with Him who sends the sunshine and the rain.

There are, perhaps, three certain summer months, with a possible fourth if there is no early frost. What, then, in this brief season, can we grow in the way of bulbs and tubers, that will give pleasure and profit?

The subject of bulbs and tubers for out-door culture is a broad

one. Much has been said upon it, and we have much still to learn. Experience, that best though sternest of tutors, is each day teaching us something new. Sometimes the lesson is dearly bought, but if the result is favorable we must not repine at the cost. But results are often very aggravating, as, for instance, after we have petted plants in the greenhouse or conservatory, if we find, by experimenting, that they do better out of doors, — either bedded out or in a cold frame.

There are no invariable rules for cultivating any plant, so much depends on the location and exposure. Two gardens may be found, growing side by side but where one only is sheltered from northerly winds, and these gardens will be in many respects entirely unlike. The gardener should select the best places, or what seem to be the best places, for his different plants, and if it proves that they do not thrive where placed, he must next year change the location. No amount of obstinacy will make a plant grow if it is not at home. I have changed plants, that did not thrive, several times, and until they seemed to grow as if, at last, they were exactly suited. There is no pleasure in growing a plant that simply drags out a miserable existence.

It is well, as far as practicable, to change every year the location of many kinds of bulbs, and their kindred; and of bedding plants as well. One plant will absorb the element that another has declined; so that change is very beneficial. We must also take special note of the country from which our tubers, etc. come, and of its conditions of sun, soil, and climate. Some plants require partial shade, others the unobstructed rays of the sun.

The careful student of nature takes note of all these matters, and the result well repays him. I often hear one person say to another "I wish I were as successful in my garden as you are in yours," when I cannot help feeling amused, knowing how the plants have been set out, and how cared for, in the unsuccessful garden. I cannot think its owner intended to be negligent; but on the other hand I know that the envied one is a more thorough student and more diligent in finding out how to make his plants grow.

Bulbs, tubers, and corms (or hard bulbs as the last are commonly called) are elongated root-stalks; and are simply storehouses for the embryo plant, serving to nourish and sustain it until the roots start; which is generally from the base. Bulbs enlarge

and throw out bulbs from their sides and tops, and sometimes upon the stem of the plant itself. Tubers increase in size and produce eyes or buds, and can be divided into as many pieces as there are buds. Corms increase generally from the top of the old corm, which decays.

In speaking of different bulbs, tubers, and corms, I shall make no attempt to treat them distinctively, but shall use the word bulb to indicate all, as that is a term generally so used, and it would confuse many people to adhere to the more exact scientific terms; moreover it is not of these store-houses that we propose to speak today, so much as of their contents and culture.

It is not the quantity of suggestions that is valuable, in most cases, but the quality. Therefore it is better to discuss a few kinds of bulbs thoroughly than to touch on and treat superficially every sort we can think of. No valuable knowledge is gained in the latter case, but only a jumble of shallow suggestions of no great use to any one.

In the northern states we have quite a large number of indigenous Lilies, Arums, etc.; but we cultivate very few of them, because we like them best in their native haunts. If cultivation would improve them it would be worth while to transplant them to our gardens, but in most cases it is quite difficult to make them grow at all, and still more so to make them grow satisfactorily. It is best therefore, speaking generally, to forbear all cultivation of native plants and bulbs, unless we have places for them as nearly as possible like that from which they come; although our native lilies, *L. Canadense* and *L. superbum*, do well in cultivation, and well repay the cultivator.

As I understand, this paper and the discussion which is to follow are mainly for the benefit of members of this Society. Therefore let it be distinctly understood that we are speaking chiefly in reference to Massachusetts cultivators, and considering what can be of use in Massachusetts gardens.

It would be of no present practical use to speak of Spring bulbs, since all that can be successfully cultivated are, or should be, already in the ground;—the snowdrop, hyacinth, crocus, tulip, narcissus,—in short all that go to make up our habitual spring display.

Our climate is so variable that we can never tell when we are out of the reach of frosts. Location makes a difference of a week

or ten days. There may be a time when, in some sunny and sheltered spots, we feel sure we might plant anything without fear of frost, while yet, within a hundred feet, we may find the ground frozen so hard that we could not expect to plant for ten days.

There are some bulbs that will take no hurt if the ground freezes an inch after planting, and there are others that feel the slightest chill. I have planted gladioli early and had the tops chilled, yet with no injury; but tuberoses must wait until the ground is thoroughly warmed and likely to stay so.

Lilies are among our most trustworthy allies after the galaxy of spring flowers has passed away. *Lilium candidum* is one of the hardiest species, but it is also the most particular about the time of planting. The bulbs must be planted when they are in the dormant state; which is the last of August or the first of September. The bulbs start in the autumn, and the foliage remains green through the winter. The bulbs will not bloom if disturbed after they commence growing. *L. longiflorum* is not as hardy as many of the other varieties, from the fact that its bulbs are liable to start in the fall if the weather is warm. It is best to cover early with leaves or light compost, as a hard frost after the bulbs have started almost invariably kills them. This lily is easily transplanted. Several years ago some bulbs were sent me in the spring, from the west, which bloomed almost as soon as those wintered in my own garden. I have transplanted them while in full bloom, taking care to disturb the roots as little as possible, and the next spring they came up strong and vigorous. *L. auratum* is quite uncertain, even with the best of protection. I plant a few bulbs every year, and charge the cost to account of "bedding plants." I think they are worth growing if I get only one season's bloom from them. I do not mean it to be understood that I do not winter any of the bulbs of this species, but merely that *L. auratum* cannot be depended upon like *L. candidum* and *L. speciosum*. Last season my bulbs were extremely satisfactory, and flowered finely. One bulb produced two stalks with thirteen blossoms on each; another eleven on a single stalk; and several bore six each. Were I to get no more than two blossoms from a bulb, I would still grow them.

All the varieties of *L. speciosum* are hardy. Album Præcox is a much finer white variety than Album. Rubrum, Roseum, Punctatum, Melpomene, and Purpuratum are all desirable varieties.

L. pardalinum (sometimes called "leopard lily") is fine and hardy. *L. excelsum*, (bright buff) is one of the most beautiful lilies we have in cultivation. *L. Brownii* is rare and costly; and with its peculiar purple outside and the pure white, waxy inside presents a striking contrast to *L. longiflorum* and the varieties of that species. *L. Leichtlini*, *L. monadelphum* and *L. Parryi* are all fine yellow varieties. All the varieties of *L. Martagon* are good. *L. Chalcedonicum* (Scarlet Turk's Cap) is one of the best. *L. tenuifolium*, one of the earliest (if not *the* earliest), is a lovely scarlet lily, with reflexed petals and very slender stems and foliage. *L. pomponium verum* is very much like *L. tenuifolium*, but is a little more robust and flowers a little later. There are many inexpensive species like *Thunbergianum*, *umbellatum*, and *tigrinum* and its varieties which are showy and perfectly hardy. I have not intended to give a complete list of lilies, and indeed have only mentioned those which I have myself grown.

There is no special mode of cultivation: at least, there are no precisely uniform conditions of soil and exposure that are imperative. I have seen equally fine lilies grown on high and on low land. But on low land they will not thrive unless the soil is thoroughly drained, for water at the roots, or wet heavy soil, is fatal. Therefore drain the wet soil thoroughly; and make it light and rich. Remember it is not the bulb that needs feeding, but the roots beneath it. If the soil is light, make it rich; and between the bulbs plant annuals, or some light bedding plants, which will serve to keep the surface cool and moist.

The IRIS in its many varieties is one of the best of our hardy garden tubers. It increases rapidly and forms large clumps, and I believe all the varieties are hardy. This genus is widely represented, many countries contributing. The English, Spanish, and German species form, as their names indicate, a European group. Japan contributes the best of all—*I. Kœmpferi*. This iris has a very wide range of color, and some of the blossoms strikingly resemble some varieties of valuable orchids. All of the genus are of the easiest culture, abundant moisture being the chief requirement. Some soils that are fatal to the lily will suit the iris. Large quantities are annually imported from Holland, and many are grown in this country. Except for new varieties, the home grown are the most valuable.

HERBACEOUS PÆONIES are reliable garden plants. I say *reliable*

because they never winter-kill. They bloom at different seasons, so that there is a succession of bloom all through the early summer months. The whole family is very showy and especially adapted to large gardens. The foliage is bright and attractive and perfectly free from insects. *P. tenuifolia* has tuberous roots, and the foliage is entirely different from that of other pæonies—being, as the name indicates, very finely divided. The blooms are small, and of a clear bright red not unlike that of a rose, which it closely resembles also in form.

GLADIOLI are by far the most valuable of all the summer blooming bulbs. They are easy to grow, easy to keep, and exceedingly valuable for cut flowers. If a spike is cut when there is only one flower out, it will keep on blooming in water at least a week, and at a season, too, when most flowers would be entirely faded in two days at the most. I would not plant gladioli in beds for show; but planted in groups, with low or medium low growing plants, they are very ornamental. The foliage must be allowed to grow in order to mature the bulb, or corm, which is forming at the top of the old one; and when grown, as advised, with other plants the ripening foliage is partially concealed and is not unsightly; whereas a whole bed of gladioli alone, with the blooms cut off, is anything but attractive.

Water is an essential requisite in the cultivation of gladioli. When the ground becomes dry, water well, so that the roots beneath the bulb will be thoroughly wet. Sprinkling when the ground is dry is worse than no water at all. It is far better to stir the earth around the roots than to supply water to the plants merely on the surface. To water a dry bed or border thoroughly requires a great deal of patience, but no one ought to attempt to cultivate flowers unless blessed with a large stock of that useful commodity.

If you wish your spikes to grow straight be sure and stake them early. A crooked spike of flowers, of any kind, is unsightly. If one wants a bed for cutting, it is just as satisfactory and very much cheaper to buy a hundred or two of first quality mixed bulbs; but if not many are wanted (as comparatively few have room for a bed made entirely of one kind of flowers) by all means get named varieties. If you look over some reliable dealer's lists of named varieties, for three or four successive years, you will find that each year a few new varieties are introduced at from four to six dollars each. The year after they are put out, you will observe

a marked reduction in the prices of some; in others not much. The difference is generally due to the varying habit of the bulbs; some being of robust growth while others are weak. The strong bulb will throw up from two to four spikes of bloom, and each spike represents a bulb forming. The weak grower will perhaps exhaust itself in giving one spike and will make a very small bulb. The strong variety will be cheaper because it increases so rapidly, while for some reason the weak grower is still retained, and its price keeps up. The prolific bulbs are the ones that are desirable; some of the finest exhibition varieties are comparatively cheap, and many desirable sorts are very cheap. Eugene Scribe and Mary Stuart (pink), Meyerbeer and Phœbus (scarlet), Nestor and Pactole (yellow with colored markings), Martha Washington (clear lemon color), Beatrix, Shakspeare, and La France (white or nearly so), Leander and Baroness Burdett-Coutts (mauve), and Africaine (very dark) are some very fine varieties; and none of them are very expensive. One can form but very imperfect ideas of varieties from descriptions. The best way if you are uncertain is to visit an exhibition of named gladioli. There you will find both new and older sorts, and, as they may be assumed to be correctly named, you can select the kinds that suit you best. Old varieties, or those that have been shown before, will of course be true to name, but the very new ones will have to be taken on trust until their faces become familiar.

Tuberous-rooted Begonias are very valuable in the garden. There are a great many varieties; and here again, unless one wishes for a select few, mixed bulbs do very well in the border; but if only a few are wanted get named kinds so that variety of color may be insured. I think the single-flowered stand the rain better than the double, for the reason that the single shut a little closer and the rain cannot penetrate the blossom. Those who have grown this class of begonias will remember that the blossoms keep closed in cloudy and rainy weather. I can tell pretty nearly whether or not it is going to rain by glancing at my bed of begonias. Sometimes they seem rather undecided and are about half closed, but generally it is one way or the other.

Mont Blanc is the best white variety that I have grown. Annie Laing is a very fine variety with large, pale pink blossoms of great substance. Countess of Kingston is a very large fine scarlet. Robusta Perfecta (scarlet) and Robusta Perfecta Rosea are Ernst

Benary's seedlings and are very fine varieties. *B. Pearcei* has beautifully marked foliage and bright yellow flowers. These begonias need the sun only part of the day and for that reason are doubly valuable in the garden, where most plants require all the sun they can get.

Dig the tubers late in the autumn and let them dry off in boxes. I think it does not hurt the roots in the least to let the tops freeze, as the tubers are already matured and ready for their winter's rest. Store them in a cool place and do not give them any water unless they get too dry, in which case they would shrivel without water. If the bulbs are kept moist they will decay, for they need absolute rest when in a dormant state. These begonias are easily grown from seed. The seedlings bloom the first year if the seed is planted early enough. The seed is very fine and must be lightly covered and kept moist by glass or paper.

GLOXINIAS can be grown very finely in a cold-frame, either planted out or plunged. I grew them last summer in a temporary cold-frame with excellent success. The location should be the same as for tuberous-rooted begonias.

My frame was left uncovered during several unexpected rains and showers. The first time I expected to see the foliage spoiled; but before the sun came out I put on the sash and covered the glass with newspapers until the foliage was dry, and they were not injured in the least. Gloxinias are easily grown from seed, requiring the same treatment as begonias. In the greenhouse they will, if started early, bloom in August or September. Mine were planted in midsummer and, as there was no bottom heat, started slowly and did not bloom until the following season. If they do not bloom the first season the bulb will be of good size and easier to keep over winter. The bulbs of the gloxinia require to be kept dry when resting.

Single temporary cold-frames are, I find, very convenient in the garden, as they can be put on a pile of leaves or earth; and in many gardens this is a great advantage, more especially where all the ground has to be utilized.

Agapanthus umbellatus is one of the few blue flowers that are really blue. Some people take the Agapanthus from the pot and plant it out in the border and it does well.

Some of the summer-blooming bulbs are better kept in pots or tubs; still they can be made very effective in the open border.

Amaryllis lutea is a hardy species which blooms in early autumn, at a time when yellow flowers are scarce, and it is, therefore, very acceptable. *A. Hallii* is also hardy and is a lovely pink variety, blooming in August. *A. Belladonna major*, *minor*, and *alba* are all summer blooming bulbs. They bloom planted out in the border in August and September, and require entire rest after they have matured their foliage. *A. formosissima* is another bulb useful both for bedding and cut flowers. Its beautiful, velvety crimson blooms when arranged with fine white flowers make a charming combination for a vase. Planted out when the ground is warm it soon starts, and throws up with the leaves a flower-stalk bearing one blossom. Shortly after, another blossom appears; and then the bulb matures, and forms side bulbs. The foliage remains green until killed by the frost. Store the same as other dormant bulbs; being careful not to cut the foliage close to the bulb, for the bud is formed in the top of the bulb. *A. Johnsonii* will bloom in the ground, and some reserve it for bedding out in summer, by keeping the bulb dormant through the winter.

There are many places in the garden and about the house where a pot of *Vallota purpurea* is very ornamental.

The *Zephyranthes* in all its varieties of pink and white is desirable, and requires no care beyond planting out in the spring, lifting in the autumn, and storing in winter.

Ismene calathinum is very beautiful in the garden. The plant is fine without the flower; I think it much handsomer than many plants that are grown for foliage only. The leaves are lance-shaped, about two and a half feet in length, of a deep glossy green, and remain green until killed by the frost. The flowers are borne on a stout stalk about three feet in height, and are trumpet-shaped, about four inches long, of a beautiful white, and exquisitely fragrant. Strong bulbs produce two stalks, and the bulbs increase rapidly. They must be kept perfectly dry through the winter. Store them in sand, and start them by giving them water while in the sand. When started, plant them out where they can be kept moist.

Choretis alba is easily grown and produces a cluster of pure white flowers not unlike some of the Pancratiums. The blooms keep in water several days.

Pancratium calathinum has flowers very much like those of *Choretis alba* and they both thrive under the same treatment and in almost any soil.

The TIGRIDIAS are all showy and worthy of a place in the garden. *T. grandiflora alba* is beautiful in contrast with *T. conchiflora* and *T. pavonia*, the two old varieties so familiar to all. It is a dead white with deep crimson markings, and the three planted together form a very showy group.

Milla biflora is quite new. It has slender rush-like foliage and white, tubular, star-shaped flowers of great substance, about two inches across, borne on long, slender stems. Each flower-stalk has from two to five flowers.

Caladium esculentum (related to the fancy-leaved Caladiums) is fine for specimen plants, for which large bulbs are best, or it may be planted in groups. The leaves are often eighteen inches across.

Richardia albo-maculata is a very ornamental variety of *Richardia Æthiopica*, our common Calla. The leaves are irregularly spotted with white and much smaller than those of the common Calla. The flower is proportionately small and has a violet throat.

Amorphophallus Rivieri is a stately plant. The bulb grows to a very large size, and as it increases the plant enlarges in proportion; the centre throws up a thick stalk, very curiously spotted, and the spathe unfolds like an inverted open umbrella. The foliage is as curious as the stalk, but is a beautiful green on the upper surface. It makes an elegant plant for the lawn. After the tops are killed by the frost, the bulbs should be stored like gladioli, and planted out in spring without starting. I have seen the plant potted in August and it did not wilt or appear in the least disturbed. Apparently as the plant had stopped growing the large bulb was abundantly able to support it, and it did not feel the change like a fibrous-rooted plant. The roots are fleshy, and have small tubers at the extremities.

Tritoma Uvaria grandiflora is a very conspicuous plant; the blooms look like spikes of flame, hence the name—"Red-Hot-Poker." It makes a great show in the garden at very little cost.

Galtonia (*Hyacinthus*) *candicans*, a plant not unlike a giant snow-drop, with its spike of drooping greenish-white flowers, forms a striking contrast to the Tritoma.

The TUBEROSE is as easily flowered in the ground as any other bulb. As it takes about four months from the time of starting to bring it into flower, it must be started either in a hot-bed or in a greenhouse. If you have neither of these, plant out the bulbs

in a sunny place, when the ground is thoroughly warmed, and after they have started give plenty of water. If there is no frost until late in autumn they will bloom in the ground; but it is not best to risk it. When they are well budded, pot in good soil and let them stand a few days in the shade. Afterwards give them the sun and keep well watered. If the weather holds warm leave them out of doors, but in case of a cold snap take them in. We generally have a few chilly days with light frost early in September—just enough to chill tender plants, and then there follows warm weather. Tuberoses are very easily chilled, but if they are taken in during turns of cold weather they can be left out to bloom.

A high bed of autumn leaves, with a few inches of soil on the top and a temporary frame with a sash, gives heat enough to start many kinds of plants in the spring, and tuberoses start readily in the gentle heat from such a bed. Place the bulbs in a shallow box close together in good soil, and you will soon find them finely started with a mass of roots, and ready to bed out. By getting a month's start in this way they will bloom in August.

I shall touch lightly on the Dahlia, although it is a very important tuberous-rooted plant, and its glory continues until the frost comes and cuts it down. The only drawback is its requiring so much room to grow in. Still there are places where such plants are very much needed; and the Pompons and single varieties are especially desirable.

When we are complaining of our severely cold winters and hot summer's sun, we are apt to forget that we are mercifully spared some other evils. No earthquakes, tornadoes, or floods devastate our loved New England. Our hard winters make us long for and quicken our enjoyment of warm weather. Now—

"Naked and lone the rosebush fair,"

reminds us of the time when—

"The buds swell out in the warm May air."

Only a little while and we may say—

"Lo, the winter is past,
The rain is over and gone;
The flowers appear on the earth;
The time of the singing of birds is come."

DISCUSSION.

William E. Endicott said that the *Amaryllis lutea* spoken of by the essayist is now called by botanists *Sternbergia lutea*, and inquired whether it would stand out over winter.

Mrs. Nelson replied that it would; her plants were taken up by mistake, but her friends have left theirs in the ground, as they should be. It must be covered like *Lilium longiflorum*.

Mr. Endicott said that there is a species of *Agapanthus*, *A. minor* var. *Mooreanus*, not so fine as the common kind, but it is deciduous and may be treated like the dahlia. The flowers are smaller and of a deeper blue than those of *A. umbellatus*. The flowers recommended by the essayist are mostly old varieties, to which many later kinds might be added. The Cypella is an excellent little flower, resembling the Tigridia. *Triteleia uniflora* and *Milla biflora* are perfectly hardy, but force easily. There is another white species of Ismene besides *calathinum*. *Amorphophallus campanulatus* and *A. bulbiferus* are fine species much like the well known *A. Rivieri*. *Tritonia aurea*, from Caffraria, has a bright yellow flower. *Montbretia crocosmæflora* was orange colored in the type, but either it has sported or seedlings have given us varieties.

Mr. Endicott urged the growing of dahlias from seed. They grow with great vigor, planted in the open ground like corn, and flower nearly as early as if tubers were planted. The seed of single kinds is sure to produce good varieties; that of double kinds may give a good flower out of two or three hundred. He had sown seed of white Pompon asters, and got every type, the principle of variation being strongly established. In saving seed the flowers should be cut when nearly withered, and hung in a dry place. Double Composite flowers make seed freely.

Robert T. Jackson said that Mr. John Richardson, who is now eighty-seven years old, has raised dahlias for fifty years, and he always saves the seed only from within half an inch of the outside edge.

Mr. Endicott said that he had found the *Begonia discolor* especially valuable out-doors. He has plants under an apple tree which thrive well, and the foliage is ornamental. It is perfectly hardy, but it is better to take it in during winter because then it flowers more strongly.

President Walcott inquired the experience of those present with

Bessera elegans. With him it barely flowered the middle of October. It was so extensively advertised by the New York florists that he thought it must do well.

Mr. Endicott said that his did not flower at all.

Mrs. Nelson said her experience and that of her friends was the same as Mr. Endicott's.

President Walcott had found *Sternbergia lutea* hardy without protection; it sends up leaves after flowering.

Warren H. Manning recommended *Amaryllis Hallii.*

E. H. Hitchings asked whether any one had cultivated any of our native bulbs.

Mrs. Nelson replied that she had tried *Arethusa bulbosa* and the Yellow and Pink Cypripediums.

Mr. Manning remarked that the Cypripediums have fibrous roots.

Mr. Endicott recommended *Trillium grandiflorum.*

Mr. Jackson said that he had propagated *Trillium grandiflorum* by division of the root; it makes but little seed. He succeeds with *T. erythrocarpum* in moderate shade with leaf-mould and cow manure.

Robert Manning said that he had found the *Trillium grandiflorum* form seed freely, but he had not succeeded in causing it to germinate, though it is plump and apparently perfect. He has two plants which in May form hemispheres two feet in diameter, each having sixty of the large white flowers. He thought it the finest of all our native plants for garden culture, to which it submits perfectly. When a boy he cultivated successfully *Erythronium Americanum* (Dog-tooth violet) which has a bulbous root.

Mrs. Nelson said that a friend of hers has a plant of *Trillium grandiflorum* on a rockery, as large as a half-bushel.

Mr. Hitchings said that a friend in Chelsea cultivates *Trillium grandiflorum* successfully, but has never succeeded with *T. erythrocarpum.*

The Chairman of the Committee on Discussion announced for the next Saturday a paper on "The Food Question," by Edward Atkinson.

BUSINESS MEETING.

SATURDAY, February 20, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The Librarian laid before the Society a complete set of the Transactions of the Norfolk Agricultural Society, presented by Henry O. Hildreth, its last Secretary, in remembrance of Hon. Marshall P. Wilder, for twenty years President of that Society.

Mr. Wilder acknowledged the personal compliment extended to him in the terms of the donation. He said that he was glad to be remembered, and still more glad to have this valuable series of books in the Library to perpetuate the memory of the Norfolk Agricultural Society. At its meetings he made his first efforts in behalf of agricultural colleges; which were seconded by some of the most remarkable Americans who have ever lived, — Daniel Webster, Edward Everett, Horace Mann, Robert C. Winthrop, Josiah Quincy, and others. Soon after, he was sent to the State Senate and elected President, where he made the first definite movement to promote agricultural education, presenting a bill which passed the Senate unanimously, but was lost in the House. He has, however, lived to see his views in regard to agricultural education carried out. He claimed no merit for these efforts, for he only followed the instincts of his nature and his sense of duty.

The thanks of the Society were unanimously voted to Mr. Hildreth for his donation to the library.

Adjourned to Saturday, February 27.

MEETING FOR DISCUSSION.

THE FOOD QUESTION.

By EDWARD ATKINSON, Boston.

Ladies and Gentlemen:

I will not begin this address as I did when I spoke to the Farmers a few days ago, and said that I had been brought before them to show them what I did *not* know about agriculture.

I will say that I am here, perhaps, to bring before you the reasons why the methods of horticulture should be in some meas-

ure extended to agriculture. I am or rather I once was a good gardener—when I cultivated my own garden; but when I became so busy as to find it necessary to give directions to a gardener, rather than to do the pleasant work myself, my garden gradually deteriorated; and now, when it has become apparently one of the obnoxious necessities of life to leave a pleasant country place and to go to the seaside in the middle of the gardening season, my last opportunity for practising horticulture has almost entirely ceased.

The direction in which the production of food is or should be tending is toward horticulture, rather than toward agriculture,—to the intensive, rather than to the extensive, system of production. If the tendency to horticulture or to the methods of horticulture shall help to substitute the use of the products of the garden,—vegetables and fruit,—for a part of the enormous consumption of meat, and especially of fat, I doubt not the benefit will be two-fold.

With this tendency to the intensive system of cultivation is coming, or has come, the necessity for treating the soil as a laboratory, rather than as a mine.

So far as I have been able to watch the progress of science in its application to the production of food, the principal attention seems first to have been given to the assumed natural fertility of the soil, rather than to its capacity to become fertile under intelligent treatment. It may be observed, by the way, that this method of treating the subject and of depending so much on the original fertility of land has led to what I believe to be some very serious errors in the science of political economy; for instance, to the temporary adoption of the theory propounded by Malthus, that population tends to increase more rapidly than the means of subsistence. This dogma was published something less than a century ago; since that date, whatever may come in the future, the means of subsistence have increased in vastly greater measure than the population of the world; while modern science applied to the art of distribution has rendered the world almost a unit in its possibility of enjoying the abundant production of each and every section.

When Malthus propounded this dogma, the value of a bushel of wheat was exhausted in from a hundred to a hundred and fifty miles of transportation even where there were good highways; today wheat is carried by millions of bushels more than half way

around the world at a fraction of its value, and live beasts are carried five thousand miles on their own hoofs. In the modern steamer the little cube of coal, which weighs one ounce and which will pass through the circumference of a quarter of a dollar, will drive a ton of wheat and its proportion of the steamer two miles. Compare this economy of the force of fuel with the waste of coal in our cooking stoves and ranges, and you may get some idea of the margin for economy in the household applications of science.

Again, no man yet knows the potential of a single acre of land anywhere, in respect to its possible production of food. We may perhaps say that it must yet be quite impossible for a single acre to sustain more than a given number of persons; but who can say what that given number of persons really is? And who can say how far the next discovery in the application of science to the use of land may increase that number—whatever it now is.

One of the most interesting developments of this subject was conducted by the late Farish Furman of Georgia, a son-in-law, I believe, of Professor Le Conte, the chemist.

After the war ended, being reduced to poverty, he first tried the law; then he entered into politics, but becoming dissatisfied with both, he went back to the worn-out soil of an old Georgia plantation.

At the time when he undertook to get his living out of this land it would produce only one-eighth of a bale of cotton to an acre,—a crop which would not pay the cost. He did not, I believe, at first study the chemistry of the soil, but he studied the chemistry of the cotton plant; and he theorized a compost which, being put into the laboratory of the soil, would, he believed, increase the yield of cotton.

He then looked around for the cheapest materials of which his theoretic compost might be practically made. He found them in the waste of the neighboring woods, in Stassfurt potash, in the phosphate beds of South Carolina, and in other materials available at moderate cost.

He measured the quantities needed and the price; and he applied this compost year by year to the worn-out soil of his paternal acres, until he achieved a crop of two bales of lint cotton to an acre; and thereby made himself a man of independent means. What had the original fertility of the soil to do with this? He was a loss to the cotton country when he died.

But he has not been alone. Others have taken a similar course; and, supplementing the theory of the compost by an exact knowledge of their land (usually more fertile than that on which Mr. Furman did his work) many Southern farmers have achieved equal or greater results. This is one of the beneficent results of liberty.

The heaviest crop, of which I ever obtained a record, was raised near Memphis, Tennessee, by digging a hole with a post auger as if to set a fence post; filling that with a well adjusted compost to sustain the tap-root of the cotton plant, and adding thereto a little surface manure to nourish the horizontal roots, which serve to hold the plant in position more than they do to feed it.

Now let us turn from this example to other experiments (of very recent date, especially in this country) in which the nourishment of *man* in the cheapest and best manner has been the objective point. In this, as in all else that I may have to say to you, I speak from observation more than by personal knowledge; and I shall only attempt to coördinate the respective lines of investigation, and perhaps to theorize a little upon the conclusions to which they seem to lead. I have not the least idea whether much of what I may have to say may not be very old and trite, or whether it will be as novel to you as it was to me when my statistics led me to consider other points of the food question.

It is but a few years since the scientists of Germany and then those of England turned their attention to the food question, and attempted to reduce the requisite proportions of the different chemical ingredients of food to a scientific formula. Having established certain data in respect to the relative proportions of nitrogenous material or protein, of fats, and of carbo-hydrates or starchy materials which are essential to the wholesome nutrition of working people,—they next appear to have sought for the materials in which these several nutrients are to be found at the lowest cost in money. So important has this investigation become in Germany where a poor soil is called upon to sustain an over-dense population, and where, even if all men were productive units, there might not be enough for a good subsistence, and yet where one in about twenty-two (some authorities make it one in sixteen and a half of all men of arms-bearing age) is called upon to waste his time in a standing army, even during the condition of passive war which in Europe is called peace, while the labor of another one in every twenty-two must go to sustain himself and the idle soldier,—

so important, I say, has this investigation become as to have induced the German government to undertake its completion, and to publish dietaries, each of which gives the right proportions of the different kinds of food necessary to sustain a working man, according to the chemical formula established by Professor Voit, together with the prices at which such food can be purchased.

The tables of these dietaries have already been published in this country, having been translated by Professor William O. Atwater, of Middletown, Ct.; who kindly furnished them to me to be included in the appendix to my address, lately given at the meeting of the American Association for the Advancement of Science, held at Ann Arbor, Michigan, in August last. Copies of that address I have not now available; a new edition is about to be printed, but the same tables may be found in the Report of the meeting of the Chiefs of the Bureaus of Statistics, of which copies can probably be obtained from Col. Wright, the Chief of the Massachusetts Bureau.

Following this line of investigation, other dietaries have been computed (if we may use that expression) by Sir Lyon Playfair and others in England, while a vast deal of most useful work has also been accomplished in the same direction by Professor Atwater, of which the results are in print.

These several dietaries of home and foreign origin are interesting, not only because they tend to reduce the nutrition of communities to a science, but also because they furnish us a fairly adequate standard of comparison as to the relative conditions of working people in Germany, in England, and in this country. They are suggestive of future political and social complications, of which the mutterings can be heard all over Europe. If you will compare the dietaries already given by Professor Atwater with those of Professor Voit, you will observe how inferior is the subsistence which can be bought in Germany at a cost of about eighteen cents a day, even if it be theoretically sufficient, as compared to the very much more generous diet which can be purchased in this section of the United States at the same cost.

Now let us consider the connection between the nutrition of the man and what we may call the nutrition of the soil. Human life, animal life, and plant life are but three names for the conversion of certain forces; these forces, for convenience, we call protein, or nitrogen, the correlative of muscle; fats, or the correlative of

heat; and phosphates, potash, starch or carbo-hydrates, the correlatives of animal fat, and of bone and sinew,—when absorbed in the human system.

The inherent fertility of the soil may support plants for a little while without well-balanced sustenance. The plant *may* derive a part of its sustenance from other sources than the soil; but with few exceptions the sustenance of the plant is held in correlation to the sustenance of the soil by bonds which cannot be severed. In a similar way the animal *may* live a little while on its own fat, if it shall have secured a supply somehow and somewhere; but it also must be rightly sustained, if life is to be prolonged.

The man must have a suitable proportion of each of these ingredients in order to attain full and mature development; the soil must be supplied with the same ingredients according to its wants; the beast, again, must be fed in the due proportion. All organic life seems to be capable of being put into a chemical formula, varying in proportion but not in its constituent terms. Each and all are sustained by much the same chemical elements,—each of course in different measure and in different proportions. Is not our problem that of balancing the forces without waste, alike with respect to soil, beast, and man?

If, then, the scientist can tell the man what proportion of animal or vegetable food will suffice to sustain him in full vigor and strength, according to the proportion of nutrients, and can direct him in what proportions, and of what kind of food he shall partake, it may happen that ere long he may tell each of you exactly what ingredients to buy and to put into the laboratory of your gardens in order to support each kind of plant in full vigor at the lowest cost; he may first ascertain exactly what you have in the soil or in the air which rests upon it, or in the water which permeates it; and next what you must add for its deficiencies, or in order to make the ingredients already present fully effective. Has this yet been accomplished? Have you not as yet more confidence in your own empirical method — your observation and the results of your own practice, than you have in agricultural theory? Yet we know how much human food men waste — may you not be wasting plant food also?

It appears that if the man is fed only with starch and fat he will become feeble or starve, even if these are furnished in apparently ample measure. It also appears that if he is fed only with the

nitrogenous portion of his food, while perhaps he may not starve, he may yet die for lack of heat or for want of some other element of life.

Has the correlation of forces, thus illustrated, been considered fully either in agriculture or in horticulture? Has not agricultural chemistry thus far consisted, to a great extent, in mere preliminary investigations? Is it not, as yet, very greatly empirical in its application? And is not this in part the reason why the practical farmer so greatly despises the book farmer? He remembers that almost all the scientists utterly condemned ensilage, while the skilful farmers, who tried it, have almost all doubled their silos.

Are we not just at the beginning of the true application of science to the nutrition both of the soil, the plant, the beast, and the man?

Let us consider a moment. Nitrogen is the most expensive and moreover the most necessary element of nutrition, so far as either soil, beast, or man is concerned. It is floating all about us. It constitutes by far the greater proportion of our atmosphere; but no man has yet fully solved the problem of combining the nitrogen of the atmosphere in a speedy and effective way. Whenever that is accomplished, the problem of plant and animal sustenance will have been solved for centuries to come, if not forever.

Now there are certain plants which are known as *renovating* plants. Why? Because in some way they serve as a link or medium by means of which nitrogen is gathered, somehow and somewhere; either from the atmosphere, or, as one of the French chemists now believes, from the *microbes* which float in the atmosphere. By means of these renovating plants, turned under in a soil already containing its necessary supply of phosphates and the like, the soil is stored with nitrogen, thereafter to yield up food to the plants which are *not* of the renovating kind,—such as wheat, rye, barley, and the like.

Clover, buckwheat, beans, cow-peas, and a few other plants are well known as renovating crops, when turned under. But now comes the doubt. Our greatest crop is Indian corn. Is this plant, or is it not, a renovating crop? If it is, how shall the soil be enriched by its use? Shall we turn it under as we do clover and buckwheat? By no means. We will presently consider how it may best be made use of, if it is the trap to catch the nitrogen. Prof. Atwater believes that it is. Sir J. B. Lawes has believed that it is not.

Before Prof. Atwater was obliged to stop, for the time, in his investigations for want of adequate means (which I hope and believe will very soon be supplied to him) he had caused several hundred experiments to be made in raising Indian corn, with and without nitrogenous manure. The result of all these experiments in different parts of the East and of the West came to this: that, by the scientific application of phosphates and potash, which are now easily obtained at very low cost, crops of Indian corn were made averaging a little less than forty-two bushels of shelled corn to the acre, on what was called poor or exhausted land. Greater crops were made, of course, by the addition of nitrogenous manure; but where this consisted of anything but stable manure which was on the premises, and reckoned at low cost, the additional crop of corn did not pay for the cost of the purchased nitrogen.

It has also been conclusively proved that by beginning with phosphates and potash, raising more and more stock, and then adding stable manure to the other ingredients, the crop of Indian corn could be steadily increased.

Where, then, does the corn plant obtain its nitrogen? Where does the clover get its nitrogen? Where does the Southern cow-pea, which thrives on the poorest land in the South — land so poor that it is often said "that 'ere bit of land ain't even fit to grow pea-vines on"—where does the cow-pea get its nitrogen?

Is the Indian corn the missing link for New England? If it is, the future of New England agriculture is assured beyond a question, because by means of the corn plant we can, in my judgment, at this time within twenty-five miles on each side of the Connecticut river, within the State of Massachusetts, raise all the beef that the people of Massachusetts require annually; and perhaps at less cost than it can be procured in any other way.

This seems as rash an assertion as a theorist can presume to make; but it is no more rash than the word which I ventured to speak some years ago in an address that I delivered at the opening of the Manufacturers' and Mechanics' Institute, in which I made the following statement: —"If I were to say to you that, next to the abolition of slavery and the use of the railway and the steamship, the re-discovery of the method of saving green crops, called ensilage, will prove to be the most important event in its effect on the material welfare of the present century, you may suggest that a

commission of lunacy be appointed to examine the condition of my brain; and yet I venture to say so." This was on the 9th of September, 1882. I am now able to cite facts strongly corroborating the prediction then made.

Mr. C. W. Garrett, of Enfield, N. C., ripens his corn, gathers it before hardening, and then converts the stalks, and leaves, still green and succulent, into ensilage at a cost of one dollar a ton. He used to buy northern hay a few years since. He also makes ensilage of cow-pea vines, rich in nitrogen, at a cost of a dollar and a half per ton, and feeds his working mules upon it without any grain; at the same time raising beef and feeding milch cows.

At the recent meeting of the farmers who practise ensilage in New York, Col. Smith, of St. Albans, Vt., gave testimony to the effect that he had planted, harvested, and put into his silo more than six hundred tons of ensilage during the last year, at a net cost of seventy-seven cents per ton; and he confirmed the evidence of others that two tons of ensilage, such as he makes, are equal in nutritive properties to one ton of the best hay.

Mr. Powell, of the firm of Smiths, Powell, & Lamb, of Syracuse, N. Y., testified to the fact that his firm were feeding more than six hundred milch cows upon ensilage, and were making the best of butter, winter and summer. At a recent national competition they had taken the first prize for the best butter; the second prize for the second best; and the first prize for the third quality. I first ordered some of their butter for trial; and have since made an arrangement for a monthly supply throughout the year.

When the value of ensilage for milk production was questioned, a "silo" farmer in Connecticut, Mr. Strong, bore witness that he was supplying the Brunswick Hotel of New York with all the milk consumed in that house, and had done so for several years.*

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* The subjoined communication embodies important statements which are best presented in the writer's own words:—

SALTVILLE STOCK FARM, SALTVILLE, VA., February 9, 1886.

HON. EDWARD ATKINSON, Boston, Mass.

Dear Sir: —I beg to acknowledge the receipt of your valued favor of the 2d instant, and also to thank you for the "Massachusetts Ploughman." I have been very much interested in reading the discussion on the subject of the production of beef in New England and the East, and have long been of the opinion that it could be produced to better advantage, and with better

The silo which Lord Walsingham built in accordance with the suggestion of my neighbor, Consul Henderson, whom I inoculated with the virus five or six years since, was the first of 1183 now in Great Britain, and the report of the Ensilage Commission of the Privy Council, of which Lord Walsingham was Chairman, bears witness to the success and importance of the matter.

Accepting as a fact that the Indian corn plant in Massachusetts will secure its supply of nitrogen in some way or somehow from natural sources, wherever the soil it grows in is fertilized with

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profit, in the East than it could in the West — taking the price which it could be sold for, quality, etc., into consideration: and that it only needed the same kind of "brain and capital" that is engaged in the manufacture of cotton, to demonstrate the fact.

In reply to your questions — I am like most farmers, I do not keep my accounts enough in detail to enable me to say accurately what any one product costs. The farm that I have has 10,500 acres; about one-half in grass and cultivation. I made a crop of tobacco last year of 60,000 pounds. I have 2,800 sheep, 150 horses (mainly Clydesdales), and about 600 head of cattle, of which 450 are registered Short Horns, being the largest herd of registered Short Horns in the world; the cost of all are so blended that I cannot give you the exact figures for any one product, though I can give an estimate that is satisfactory to my own mind, but it would be more satisfactory if I could give you the cost in figures, the same as you can the cost of a yard of calico; but I will give you my estimate, the best that I can.

Question 1st. — At what cost can you put good corn ensilage into the silo?

Answer. I estimate that corn which will yield sixty bushels per acre, will make thirty tons of ensilage per acre; and that it can be grown and put into the silo at $1.30 per acre [ton is intended].

Question 2d. — How many tons will carry a steer one year for green fodder?

Answer. I think that forty pounds [per day] is a large feed for a yearling steer, and seventy-five pounds for a two-year old steer.

Question 3d. — What do you feed with the green fodder?

Answer. This depends much on the kind of cattle, and how they are to be handled. If they are to go on grass in the spring, good sweet ensilage will keep them growing all winter; if they are to go to the butcher in say June or July following, I feed them all of the cotton seed meal and corn (ground with the cob), that they can digest. Cotton seed meal costs twenty dollars per ton at this depot.

Question 4th. — At what cost can you make a steer ready for the butcher, at twenty months old?

Answer. Very much depends on the treatment and care of the feeder, and whether fed on grain and ensilage, or partly on grass, as in this part of the

300 pounds of muriate of potash and 150 pounds of phosphate of lime at a cost of $7.50 per acre,—then the best speculation of the day may be to buy up the deserted hill farms lying each side of the Connecticut River, within a range of thirty or forty miles, in order to convert them into beef factories for the supply of Boston. We will say nothing of milk, butter, and cheese.

What then is needed in the application of science to the production, distribution, and consumption of food? Each acre of land may require a little different proportion of the nutrients, as each man may call for a little more or less nitrogen, a little more or less fat, or a little more or less starch; or as different plants may vary in the same way. But has not the time arrived when, by means of close observation, and by the application of science, the ration due to the soil, the ration due to the plant, and the ration due to man can be measured and defined, and its cost ascertained, with exactness and certainty?—No one has, however, yet been able to answer the conundrum which I put about a year ago: "What is the cost of making a pound of beef?"

The nutrients which are contained in the several standard rations of Voit, Playfair, and others vary somewhat in the relative proportions of the several ingredients; but Prof. Atwater has reduced them to "calories" or equivalents of heat, and by this standard they are all very nearly identical. The standard of each and all for one day's ration of an adult working man is a little more than three thousand equivalents of heat. The waste of some New England families is made apparent by the fact that Prof. At-

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country. A steer is simply a machine for making beef and fat; and you might as well undertake to run a large steam engine with little or no fuel as to make beef without plenty of food, and feeding it as carefully as you would feed an engine; and it will pay for attention as well as an engine. I estimate that I can make beef here of the best quality at four cents per pound, live weight, and that it can be made in New England at five cents per pound, and that the steer should weigh from fourteen to fifteen hundred pounds at twenty to twenty-four months old.

The making of beef is in its infancy in the United States, and in my opinion the Eastern States will hold their own with the West — and as soon as more capital and brains take hold of the matter, as they have of other manufacturing interests, that large sums could be made, and a better return on the capital secured than in any other manufacturing business.

Yours very truly,

GEO. W. PALMER.

water has reduced the actual rations which have been given him by Commissioner Wright and, in some cases, he finds that the food consumed or wasted yields 7800 mechanical equivalents of heat per man.

The dietaries of a large number of mechanics, operatives, and working people in Massachusetts, gathered by Col. Wright, coincide closely with other figures and proportions of food consumption which I obtained in Massachusetts and Maryland. (The proportion of animal food, and its proportionate cost, are even greater here than in some rather startling statistics which I shall give you presently.)

Average weight of food per person.	lbs.	
Meat and fish	.89	
Milk, butter, cheese, and eggs	1.29	
Animal food	2.18	
Vegetable food	3.02	
		5.20
Cost of meats (average)	11 cts.	
Milk, butter, cheese, and eggs	6	
Animal food	17	
Vegetable food	8	
		25 cts.
Nutrients, by weight.	lbs.	
Protein	.28	
Fat	.41	
Carbo-hydrates	1.17	
		1.86

The excess or waste is almost wholly in the fat, of which .13 lbs. or less than one-third the average consumption noted would suffice according to Voit's standard; which, as compared with Playfair's and those of two other authorities, is the highest of all.

The "calories" or equivalents of heat in the several standard dietaries of Voit and others range from 3031 to 3159.

The corresponding units in our Massachusetts dietaries average 4410; or about 600 above the standard of the German soldier when engaged in a forced march or in the most severe work of war. We may be thankful for the possibility of this abundance if it does us any good; but let us prate no more about the "greasy" German when we eat three times as much fat ourselves.

This huge excess was not always to be had; there was a time of short commons once in New England, and then our grandfathers had gumption enough to get the most out of the least money.

In illustration of the way in which the process of natural selection may go on without exact intelligence as to what is being done, it is interesting to observe that the oatmeal of the Scotchman is very nearly an ideal food. It contains the three nutrients which I have named, in almost the exact proportions of Voit's standard ration; and we find the Scotchman, who has been brought up on oatmeal, a stalwart, vigorous, and effective laborer in every branch of work to which he applies either his muscle or his mind.

Again, the fried fish balls or the brown bread and baked beans of New England are found to contain nearly the right proportions of nutrients required, according to Voit's standard. The pease porridge, seasoned with savory herbs, in which a little bit of pork is stewed, the common food of the French Canadian, is again consistent with Voit's standard.

The macaroni and grated cheese of the Italian laborer again corresponds to this standard,—the cheese, so much neglected in this country, furnishing the right proportion of protein.

And, again, the hog and hominy of the Southern negro, in the proportion in which it is served—one peck of meal to three and one-half pounds of bacon for a week's supply—corresponds very nearly with the same standard.

In all these cases, by a process of natural selection, people who have but little money to apply to the purchase of food, have found out how to get the largest value and the most adequate nutriment at the least cost.

What we have now to do is to bring this economic practice into a scientific form, and to show how to get the same good subsistence in rations of greater variety and of more appetizing properties than those which are named, and yet at the same cost.

I can, today, at any of our markets in Boston, buy the trimmings of beef at one-half a cent to one cent a pound, and can convert them into bouillon in this little vessel which I have by me, and which I myself invented, by the use of a common kerosene hand lamp, as you see.*

Adding to this bouillon, bread purchased at the price at which

* During the delivery of the address, the process was in progress.

the Howe National Bakery sells it in New York, to wit: three cents per pound, and perhaps a little dish made from skimmed milk with cheese stewed in it, I can make a full and nutritious day's ration thoroughly cooked in this cooker, except as to the bread, with an expenditure of less than seven cents per day for as much as it is necessary or suitable for me to eat. What we need is the right direction of force.

I have said that we should convert the waste lands of Massachusetts into beef factories, rather than misuse land and its product by the conversion of corn into pork. Here is a recent development, very novel to me and doubtless to most of you, brought out by a chance remark of mine to Professor Atwater. I said to him, one day, "I believe the Western men compute five pounds of shelled corn to one pound of pork."

"Well," said he, "then they waste about four pounds of corn."

I replied, "How is that? I have always looked upon pork as condensed corn."

"Then," said he, "you have made a mistake. I will make a computation and give it to you."

I will not weary you with the exact figures, but they show that Indian meal, although not quite so near to Voit's standard in its relative proportions of nutrient as oatmeal, is next to it in its nutrient value.

Assuming that it takes 1000 lbs. of corn to make 200 lbs. of pork, we have in that corn nearly 900 lbs. of nutrients, well balanced. When this is fed to hogs we have wasted all the starch, a considerable part of the protein, and we have almost nothing but fat,—and only 180 lbs. of that.

The general result of Professor Atwater's investigations, applied to the dietaries furnished him by Col. Wright from the statistics of Massachusetts, serves to prove that the great waste in New England is in the enormous excess of fat; which we eat, but cannot properly digest and assimilate.

Therefore beef rather than pork is the farmer's proper objective point; because in the production of beef we obtain from the starch and fat of the corn plant a larger proportion of protein or nitrogen than can be found in pork, or, indeed, in most other kinds of animal food.

The same remark applies to the production of milk and cheese (especially of skimmed milk cheese), provided it is stewed in such

a way that it can be digested. One pound of skimmed milk cheese, if cooked in a suitable way, affords more nutrition than three pounds of the best beef.

When I first accepted the invitation to give this lecture, I suggested to Mr. Appleton of your Committee that the title should be "Was Nebuchadnezzar so badly off, after all, when he went to grass."

Nebuchadnezzar had lived on the fat of the land, as we do; and when he went to grass, he went to a more wholesome food. We need more vegetables and less fat—more garden and less farm.

No address of mine would be complete unless it contained some figures; and I will now venture to repeat some figures upon food which I have given elsewhere, but which I am very sure will bear repetition, even if they weary you a little in their recital.

I suppose that what has led to my being here today is, mainly, the fact that I have attempted to measure the price of life, and to determine, more exactly than any one has yet done, the proportions and relative cost to working people of food, clothing, and shelter, under present conditions of life.

My earliest investigations had for their objective point a determination of the money value of the annual production of this country — an appalling problem, but one which I may believe has been solved with approximate accuracy, for the reason that many lines of similar investigation, which have since been pursued under the supervision of Col. Wright, Prof. Hadley and others, have led to almost identical conclusions. Not to weary you with incomprehensible figures of unnumbered millions, I will simply announce, as a fact appearing at the end of the whole investigation, the following, viz.: that the average sum earned by, and so available for subsistence of, each adult person does not, as regards nine-tenths of our population, exceed forty cents per day.

The working group (as distinguished from the family group) consists of three persons, *i. e.*, each person, who is engaged in any kind of gainful occupation for which he or she is paid in money wholly or in part, sustains two others. The family group is a fraction under five persons. Ninety per cent of the people of the United States who are engaged in any kind of gainful occupation are what may be called *working* people in the narrow sense of the word. I, myself, claim to be a working man; but what I mean is that ninety per cent of the people of the United States are in the

position either of laborers, mechanics, factory operatives, domestic servants, or small farmers who work harder than their hired men; or are clerks, salesmen, teachers in the common schools, or engaged in similar occupations,— people whose accumulated wealth consists merely of small savings, and whose daily bread depends substantially upon their daily exertion.

With respect to this ninety per cent each one, upon the average, must be sheltered, clothed, and fed on what forty cents or less will buy each day, — profits and taxes having been previously set aside from the aggregate production. Here, in the East, where machinery has been most effectively applied, the average income of each person in those classes may be rather more. In the South and West, where manual labor is applied in greater measure, it is certainly less.

With respect to this class of persons, one-half the price of life is the price of food. Of each fifty cents which a mechanic in Massachusetts will expend for himself and his family, twenty-five cents on the average will be paid for food, supplying one adult person for one day. We may count two children of ten years of age or under as equal to one adult in their consuming power.

Of this expenditure of twenty-five cents, — if the subsistence of the factory operatives of New England and of the Middle States may be taken as a fair standard of the whole (they being chiefly adult women)—the proportion of each kind of food is substantially as follows: —

9½	cents	for meat and fish,—of which about three and a half cents is for beef.
5	"	for milk, butter, and cheese.
½	"	for eggs.
2½	"	for bread.
2	"	for vegetables.
2	"	for sugar and syrup.
1	"	for tea and coffee.
1	"	for fruit, salt, spice, pickles, etc.

23½ cents in all; 1½ cents may be added for sundries, making 25 cents per day per adult.

You will observe that three-fifths of this sum is expended for animal products, — meat, fish, milk, butter, cheese, and eggs; and

since food is one-half the price of life, it follows that three-tenths of the entire price of life for ninety per cent of the population of the United States is expended for animal products, provided people on the average live as well as the factory operatives of New England and the Middle States. I do not suppose that they do live as well; but we may say, I think with certainty, that by so much as they eat less or poorer food they are inadequately served.

This is not a high standard, — far from it; but all observation sustains Professor Atwater's scientific analysis. It consists too much of meat, and too much of fat. It is not a scientific ration. A scientific ration quite as nutritious, quite as varied, and much more wholesome can be purchased for from one-half to two-thirds the money. The women in the Sherborn Prison are well nourished at about one-half the expense which I have given, to wit: at about thirteen cents a day; and notwithstanding their customary bad condition when sent to prison, and though remaining for terms too short to admit of putting them in a condition of complete health, they yet gain both in weight and strength, almost invariably.

Computing by this standard of the factory operatives of New England and the United States, we reach results in millions, that are somewhat astounding. If each person in the present population of the United States (counting two children of ten years or under as one adult) is served in this proportion, the meat and fish ration eaten by them costs each year . . $1,825,000,000

The milk, butter, and cheese, at the rate of one-half to two-thirds of a pint of milk per day, one to one and one-fourth ounces of butter, and a scrap of cheese, cost, at average retail prices $912,500,000

The eggs, at one for every other day, at twelve cts. per dozen, amount per year to over $91,000,000

$2,828,500,000

Vegetable food, tea, coffee, etc., 1,825,000,000

$4,653,500,000*

*At the average of the ration of the working people of Massachusetts,

The consumption of poultry and eggs, at retail prices, taken separately, comes to at least the value of $200,000,000 per year; or more than the combined value of the product of the silver mines and the product of the pig-iron furnaces, with the entire wool clip added.

These rations or proportions may well be considered when economic legislation is under consideration.

The least conspicuous industries are the most important; and the most aggressive and overbearing, like the silver interests (so called), are of the least possible consequence. The product of the hen yards, in eggs alone, is, as I have so often had occasion to say of late, more than double that of the silver mines.

At three and a half cents to each person per day for beef, the value of the beef consumed within the limits of the United States would be in the neighborhood of $600,000,000 a year; or more than the entire product of all our textile factories put together. How much more it is than three and a half cent's worth a day cannot be computed.

I have thus brought before you in a hasty manner three separate directions in which the application of science has yet a vast and almost unexplored field:—

First. Determination of the ration due to the land;—science applied to the production of protein, fat, and starch in vegetable growths, in right proportions for the food of beasts as well as of man.

Second. Science applied to the consumption of protein, fat,

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which I have previously given you, the consumption of the present population of the people of this country would be—

Meat and fish,	11 cents a day, . .	$2,007,500,000
Milk, butter, cheese, and eggs,	6 " " . .	1,095,000,000
Vegetable food,	8 " " . .	1,440,000,000
	25	$4,542,500,000
Mr. David A. Wells estimates our liquor bill at about .		500,000,000
Total, over		$5,000,000,000

This is too much, because we live better in Massachusetts than they do in many places, and our food costs more here than it does in the West. Yet I think $4,000,000,000 would not be too high.

How much of it is wasted?

How much is badly cooked?

Can you bear to think of it?

and starch by beasts, in the production of meat and dairy products at the lowest cost.

Third. Science applied to the consumption of food by man.

To these must be added the most difficult problem of all — science applied to the retail distribution of perishable products.

There is one street in Boston which I suppose is the most costly one to pass across that can anywhere be named. It is Commercial Street. On its eastern side good fish are often sold at wholesale for one-half a cent per pound. On the western side of the street fish of the same quality are sold at from six to ten cents per pound. Why does it cost so much to carry fish across that street for distribution?

Here is Samuel Howe's bread. Three cents a pound for most excellent bread. Here is the bread sold by a prominent baker at his shop in Boston which is nearest to the dwelling places of the poor. The price is nearly six cents per pound. The bread is no better than that made by Samuel Howe, if as good. Where is the Samuel Howe of Boston?

The meat in this cooking vessel is good meat, of which enough can be bought in Quincy Market every day to feed one thousand people—as I am assured by the market-men.

Where is the measure of intelligence, on the part of those who need to save their money, which may enable them to buy this meat, and to cook it properly, as readily as I can do it? To be sure the price would rise a little if it were in demand for anything but rendering into fat—yet now it is all wasted.

It has been in dealing with these subtle problems in economic science that I have gone so far afield in the treatment of matters of which I found myself very ignorant at the beginning, and of which even today I know but little if any more than yourselves. All that I can do is to urge upon you the vast importance of these matters, and to suggest to the members of the Massachusetts Horticultural Society that there is need of the application of right principles and accurate methods, like those of horticulture, in the production of beef, milk, butter, cheese, and eggs, as well as in the production of vegetables and fruit.

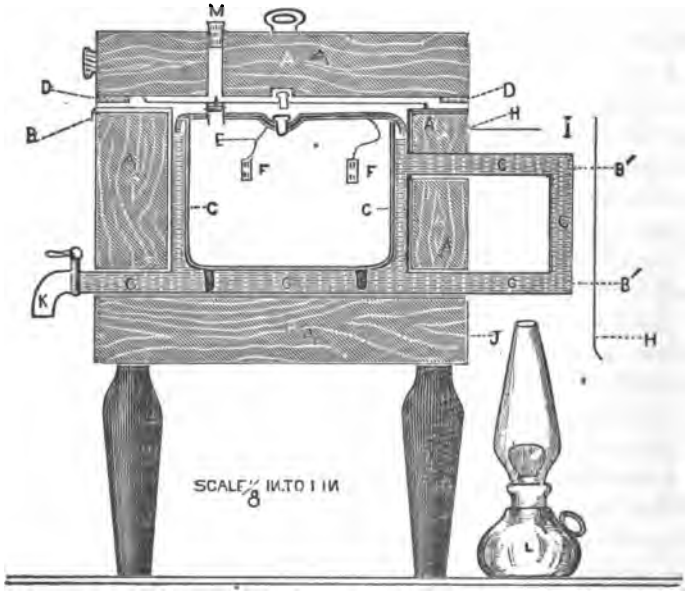
When this shall have been done, the science of agriculture will perhaps be as far advanced as the science of floriculture and of fruit production has already been through the efforts of this Society.

What we most need is to save waste. We are wasting good land in New England by letting it lie idle for want of brains and capital; laborers to work it are wanting. We are wasting hay by feeding it to stock when chopped corn stalks would serve as well. We are wasting food on every table—perhaps proportionately more on the tables of the poor than on those of the well-to-do. We are smothered in our own grease, and, like Nebuchadnezzar, we need to be sent to grass.

But what if we saved all this wasted wealth—what should we do with it? Perhaps it would bring about the realization of the dream of the labor reformer—eight hours for work, eight hours for sleep, and eight hours for leisure.

When we earn our leisure by saving waste we shall perhaps know what to do with it. The "Old Bohemian," in his Cookery Book, says that "leisure consists in the diligent and intelligent use of time." Whether the leisure which I have devoted to this lecture merits the second adjective in his definition, I leave to you to decide.

The apparatus mentioned on page 91 as in operation during the lecture is shown in vertical section in the subjoined illustration.



THE ALADDIN COOKER.

REFERENCES TO CUT.

AAAAA—Box made of pine wood 1½ to 3 inches thick, according to size of cooker.

B—Lining of tin or tinned copper fitted with arm of copper B′ B′ through which the water circulates, and in which it is heated by the lamp L. This arm should be 3 inches broad by 1 inch deep.

CC—Cooking vessel which may be of metal; preferably of porcelain or of glass.

DD—Felt lining to cover.

E—Cord attached to perforated ears or rings F F.

GGGGG—Water in circulation, heated by lamp L to about 200°.

HH—Hood of tin around the arm B′ B′, to concentrate the heat upon it.

I—Vent to tin hood for draft.

J—Tin guard to keep heat from wood.

K—Faucet to draw off water.

L—Lamp with wick ½ to 1 inch wide, according to size of cooker.

M—Orifice for thermometer.

N—Orifice to cooking vessel, with screw cap for thermometer.

Rounded corners are desirable inside for convenience in keeping clean. Begin with tepid or cold water if glass vessels are used.

The essay was also illustrated by samples of Samuel Howe's bread; which was cut up and tasted by many of the audience with satisfaction—it was not quite so white as the Boston bread but was of excellent quality.*

Discussion.

O. B. Hadwen said that he highly approved the essay. We are the most extravagant people on the face of the earth; and the time is coming, and we are not far from it, when the principles

* Since this paper was read, the author has supplied the following detailed directions and illustration, for constructing a cheaper form of this cooker:

Take a common butter firkin or keg, marked *AAA* on the diagram. In this put a wooden pail, marked *BBB*, or an unpainted tin pail, so as to make a distance of about one inch between. Pack this space between the two with sawdust, *CCC*. Over the edges of the firkin and the pail, which should be on a level, place the annular tin cover, *DD*, to prevent water or grease getting into the sawdust. Cover the firkin with a wooden cover, *E*. Put also an inside cover, *E*, over the pail. Inside the pail, with room enough around it for at least half an inch of water, place a porcelain jar or stone pot, *F*, in which put the food to be cooked. Insert two large corks, *GG*, through the wall of the firkin and of the pail, each pierced with a half-inch hole. In these holes place a tin or copper pipe, *HH*, half an inch in diameter, packed water-tight; any other method of securing a water-tight joint may be used. Fill the pail with water so as to cover both the orifices to these pipes. The water

laid down by the essayist must be applied amongst us, as necessity has caused them to be in other nations.

Hon. Marshall P. Wilder said that he could not allow the essayist to go away without an assurance of the great gratification we had derived from listening to his suggestions. By his wisdom he has given us food for thought, enough for the rest of our lives. The

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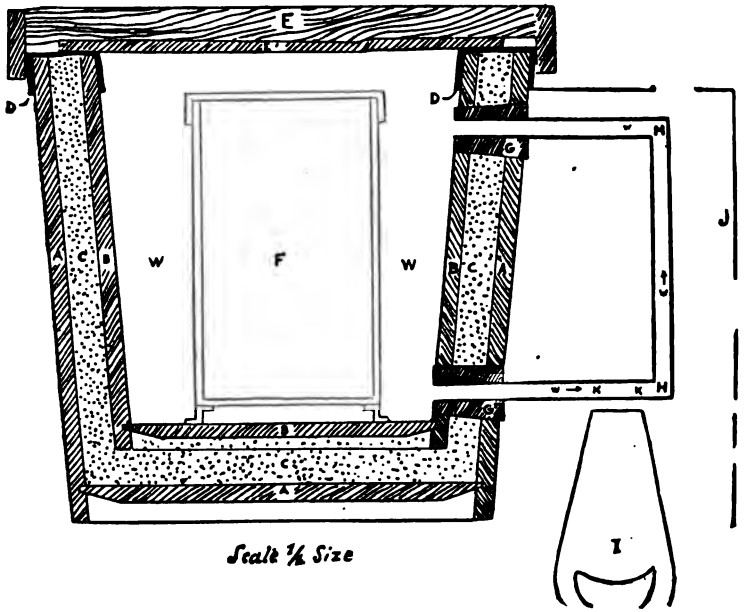
is marked *WW*. At the place marked *KK*, broaden the water pipe so as to get more heat. It should here be wide enough for the edges to project outside the lamp chimney, with the under side concave, and then the condensed moisture will not drop upon the chimney and break it. Set the whole apparatus on the edge of a table. Underneath the tin or copper arm or pipe, *HH*, set the lamp *I*, on a chair or stool. If a tin hood *J*, is put around this tin pipe a little way from it, the water in the pipe will be heated more rapidly. Light the lamp with the wick low at first, and keep it low until the metal hood is heated; then put it up high, and after that it will not smoke.



Scale ¼ Size

Since this form of the cooker was designed, I have had one made of two firkins — worth ten cents each — and about fifty cents worth of tin work. In a stone pot I have made most excellent beef bouilli; and fricasseed chicken out of very ancient hens; and have cooked half a ham, etc., etc.

Meat may be cooked in its own juice or in water. After the food is cooked it will merely keep hot, and become more tender, as long as the lamp is kept burning.

speaker hoped the essayist might have been able to give us information in regard to the kinds of fruit most desirable as food. He (Mr. Wilder) has it on his table every day in the year, mostly uncooked, and has not had a serious case of dysentery in his family for fifty years—an exemption which he attributed to the free use of ripe fruit. He concluded by moving a vote of thanks to Mr. Atkinson for his very useful and interesting lecture, which was unanimously passed.

Mr. Atkinson said he knew the value of fruit, and most heartily concurred with what Mr. Wilder had said of its value. The great problem in regard to this as well as other perishable commodities is how to get them to the consumer without too great expense for packages, transportation, and distribution. They frequently cost the consumer two or three times the wholesale price. Bananas contain more nitrogen than any other fruit. He still recollected the taste of some dried bananas sent to his father forty years ago; and he hoped to see this fruit become plenty and cheap. The economical side is the most serious part. The wheat of which the excellent bread shown here as sold at three cents per pound was made probably came from Dakota. One man can produce 5000 bushels of wheat in 300 days, and this makes 1000 barrels of flour. The labor of one man puts the wheat into the barrel, the labor of one man and a half moves it from Dakota to New York, and one-half a man's time keeps the entire machinery of manufacture and movement in order. The speaker estimated that the labor of seven persons would yield to a thousand men their proportion of bread. In Boston bread costs six cents per pound instead of three, and the largest part of this cost is in getting it from the mouth of the oven to the mouth of the consumer. In New York the price is three cents; in London four cents. The hardest problem connected with the food question is the retail distribution of products.

William C. Strong said that so many points had been suggested by the essayist that we hardly knew what to say. Mr. Cushman, of Plymouth County, says that he cannot afford to use hay to make milk, and has made other very positive statements of what he can and cannot afford to do. Mr. Atkinson's paper has opened a wide field; the question before us is the maintenance of our men and women.

President Walcott said it is certain that the most perfect condi-

tions of physical life, in Massachusetts, exist in our penal institutions. The inmates of the prisons at Concord and Sherborn are better fed and clothed than the average workingman. If we should do as much for the law-abiding citizen, it will be a greater triumph than success in horticulture.

Mr. Atkinson, in reply to an inquiry from a lady how to cook cheese, referred to Williams's "Chemistry of Cooking." He gave an account of an experiment of his own in making a cheese soufflée which proved delicious. He took a pound and a half of the skimmiest cheese (which he broke up with a hatchet), two loaves of stale baker's bread, two quarts of skimmed milk, salt, pepper (black and Cayenne), dry mustard, and about a salt spoonful of bicarbonate of soda. The mixture was kept simmering over night in a water-bath; and at breakfast the fish balls and brown bread were neglected for it. Though it was not indigestible, one who partook of it very freely was made sick, so much nitrogen and protein making it too rich. One pound of skimmed milk cheese, which has sometimes been sold for a cent and a half per pound, if rendered digestible is worth as much as three pounds of sirloin beef, costing sixty cents—that is, it has as much nutritive value. Cheese is too much neglected as an article of food, in this country. The Parmesan cheese served with macaroni is a cooked cheese. In Italy it is common to serve grated cheese with vegetable soup, and he had had it thus served in New York. When stewed, or grated and cooked in soups or with macaroni, it is digestible and cheap food.

In answer to an inquiry, Mr. Atkinson said that butter is only fat—it gives the element of fat required in a well balanced dietary. Oleomargarine when well made of good suet is a wholesome fat food; and, if sold for no more than it is fairly worth, he saw no objection to using it. He thought the dairy people were making a mistake in fighting it.

O. M. Tinkham, of North Pomfret, Vt., said that a person, near this city, has kept from six hundred to a thousand swine, which were fed on city refuse until it was thought to give them the cholera. These hogs were cooked in great vats, the fat floating at the top, and five hundred tubs of it were seen marked with the name of a person in New England who runs a creamery.

President Walcott said that he had had as much to do with the execution of the laws in regard to oleomargarine as any one, and

he thought the State amply protected; there is no possibility of selling a pound of oleomargarine under any other name.

Mr. Atkinson said, in pursuance of his previous statements, that good bread can be made for less than three cents per pound. We need a capitalist who will seek his fortune in making bread. Bread made of American flour is sold in London for less than four cents per pound.

The announcement for the next Saturday was a paper by W. W. Rawson, on "Vegetable Growing."

BUSINESS MEETING.

SATURDAY, February 27, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President C. H. B. Breck in the chair.

William H. Spooner, Chairman of the Committee appointed January 30, to nominate a candidate to fill a vacancy in the Vegetable Committee, caused by the death of George W. Pierce, reported the name of P. G. Hanson, of Woburn, who was thereupon unanimously elected.

The Secretary announced that the medals offered by the Royal Union for the Cultivation of Flower Roots, at Haarlem, to be awarded for the best exhibitions of Hyacinths at the Spring Exhibition of this Society, had been received. He also laid before the Society a letter from the above mentioned Union in regard to medals to be offered as prizes for flowering bulbs at the Spring Exhibition of this Society, in 1887, and a letter from the Pennsylvania Horticultural Society (which had received the same proposition) in regard thereto. The subject was referred to the Committee on Establishing Prizes, with full powers.

Adjourned to Saturday, March 6.

MEETING FOR DISCUSSION.

VEGETABLE GROWING.

By WARREN W. RAWSON, Arlington.

This subject is one which enlists the attention of very many of our horticulturists at the present time. In the practical pur-

suit of it, success depends more on the man than on anything else; presuming him to have secured the proper soil, which should be a light sandy loam. In the vicinity of any of our cities, large and small, can be seen small places devoted to the growing of vegetables, either as a special business or in connection with some other branch of agriculture. It is now one of the principal lines of business carried on in the vicinity of large markets, and is every year growing larger and larger, and extending farther and farther from the cities. The suburban land is becoming too valuable for this use, being wanted for building lots or for manufacturing establishments, which must be located near the large cities on account of railroads and help. These requirements are fast filling up the suburbs of Boston for five or six miles out; within which distance scarcely any land available for gardening now remains unappropriated.

The varying demand of the markets governs the amount of business done by growers in the large suburban towns; but the product of two or three acres can be readily disposed of in almost any town containing from four to five thousand inhabitants—and in such markets the prices are much better than in large ones, and a profit is sure on a limited quantity.

The vegetables grown are comprised in the following list:—Artichokes, Asparagus, Beans (Bush and Pole), Beets of various kinds, Brussels Sprouts, Cabbages (early and late), Carrots, Cauliflowers, Celery, Corn, Cucumbers, Dandelions, Egg Plants, Endive, Leeks, Lettuce, Martynias, Melons, Mushrooms, Onions, Parsley, Parsnips, Peas, Peppers, Potatoes, Radishes, Rhubarb, Salsify (Oyster Plant), Sea Kale, Spinach, Squashes, Tomatoes, Turnips, and Water Cress.

There are many varieties of some of these; but time and space will not permit me to speak minutely of them all. I will therefore give an account of the soil and mode of cultivation needed by some, and describe their peculiarities; selecting the most important, and taking them in the order in which they appear in the foregoing list:—

Artichokes (*Cynara Scolymus*).—The soil required is a deep sandy loam. In this country the artichoke is but little known, as people generally have not learned to use it; but it is of the easiest possible culture, being hardy in our climate and readily propagated from roots or suckers. The Green Globe is the principal variety. It

should be grown in rows three and a half feet apart, and the plants two feet apart in the row. The flower head, which should be taken before it has reached maturity, is the edible portion, and is eaten either cooked or in the raw state. The shoots are sometimes blanched in the same manner as endive, and are then used as a salad.

ASPARAGUS.—This will thrive on almost any sandy soil, even if quite light; and the lighter the soil, other things being equal, the earlier the crop may be got off. It may be grown continuously on the same land almost any number of years without being renewed. It takes four years from the sowing of the seed before a full crop can be cut. In preparing the land a liberal dressing of manure should be given, and this should be thoroughly and deeply worked in. In setting the plants, care must be taken to spread the roots out properly, the best plan being to plough out light furrows or drills three and a half or four feet apart, and put the plants a foot apart in the rows. When the plants have become sufficiently established to be fit for cutting, this is followed up each season until about the first of July, or when green peas begin to come on. After this the tops are allowed to grow until fall, when they are mowed off and a liberal dressing of manure is put on.

This vegetable is one of the best for shipping, and therefore it may be grown at a considerable distance from market, where land is cheaper and where it may be made much more profitable than if grown on the high priced land very near the large cities. The two principal varieties are the Conover's Colossal and Moore's New Giant. The former has long been the leading market sort, but it is claimed that the newer strain is superior in size and quality.

BEANS.—The English or broad varieties are but little grown in this country, but are worthy of more general cultivation than they have received. They will succeed best in a strong moist soil, and cool situation. They should be planted as early as the ground can be properly fitted in spring, in drills three feet apart, the beans five or six inches apart in the drill. When the pods begin to form it is well to pinch off the ends of the shoots, so as to throw the nourishment into the pods instead of letting it go to increase the size of the plants.

The Bush varieties are quite an important crop in our market gardens, and will succeed best on a rather light sandy loam.

They should be grown in drills three and a half feet apart, the beans being put about six inches apart in the drill. The earliest market varieties are the Six Weeks and Early Mohawk. These are followed by the White, Black, and Golden Wax, which are succeeded by the Yellow Cranberry and Dwarf Horticultural. All these are planted in this locality about the first week in May.

The Pole varieties are less hardy than the bush sorts, and are planted about two weeks later; in rows three and a half feet apart and hills two feet apart in the row. The principal varieties are the Red Cranberry, Pole Horticultural, Sieva or Small Lima, and Large White Lima.

Although there are some other sorts of garden beans, these are the leading ones grown.

Beets come next in order. The earliest are the Egyptian, Eclipse, and Bastian. By some the Egyptian is called the earliest, but others say the Bastian is just as early, and others the Eclipse. The Egyptian is a very early beet, and is very good when small; but when full grown it is woody, and of very poor quality. The Bastian is, I think, just as early; it is not a true blood beet, but is sweet and of very good quality at all times of the year. The Eclipse is quite new, having been in the market only four or five years; it is a blood beet, very fine grained, of good shape and good at all seasons of the year; and it is perhaps the most popular of all beets at the present time. The next we shall name is the Dewing; this is the kind most extensively grown, and is in my judgment the best of all for summer and winter, being a true blood beet and not growing too large for table use. It is the kind most used for greens, and is in favor for the family kitchen garden. There are several kinds grown for feeding cattle, such as the Long Red, Red Globe, Yellow Globe, and French Sugar.

Beets are grown, especially the earlier varieties, as a first crop, and are planted by machine in rows twelve inches apart; rows being left out at proper intervals for celery, as is done on ridges for horse-radish. Of the three earliest sorts above mentioned, two crops can be grown on the same land each year; the first being sown about the fifteenth of April and a second about the fifteenth of July. Beets require good land, well manured; and if desired early must be left quite thin in the row. The late ones or those of the second crop can be grown closer together; this applies also to the kinds used for cattle, and many tons of these can be raised on an acre.

The CABBAGE is one of the largest of vegetable or market garden crops. The soil selected should be a deep loam, quite moist, for the early crop; and good strong land for the later. The kinds are very numerous. The Early York is about as early as any grown; the heads are very close and rather small. The Early Etampes is very similar; the head being quite pointed. The Early Wakefield is one of the best; it is quite large and early and is extensively grown, as is also Henderson's Early Summer, which is almost the only one at the present time grown in New England for second early. The latter is about a week later than the Wakefield, but is very much larger—more like the Flat Dutch, but earlier. There are many strains of this variety which have been produced by selection within the past few years. The originator of this cabbage was Mr. Abram Vansicker, of Jamaica, L. I. The seed first obtained was bought by Peter Henderson for a very large price, and the variety received the name of the Henderson Cabbage; or Henderson's Early Summer. Fottler's Improved Brunswick is a very fine variety, of which too much can hardly be said in commendation. It is very large, and one of the best kinds in cultivation for late summer or early fall use.. It is about two weeks later than Henderson's Summer. Next come the Flat Dutch and the Stone Mason, both adapted for fall and winter use; the Marblehead Mammoth, which is very large; the Curled Savoy, preferred by some for winter use; and the Drumhead Savoy, very much larger than the Curled and much more profitable to grow.

Red cabbages are used for pickling; there are two varieties, the Large Red Drumhead and the Small Red Dutch.

The quantity of manure that may be applied to this crop is very large. It will take twenty-five cords of fine manure to the acre, with a ton of chemical fertilizer, and a liberal supply of water in dry seasons. It is thought by some that hog manure is not fit for cabbages, but I save all my manure from my cellar, where I keep fifty or sixty large hogs, for my cabbage crop.

CAULIFLOWERS.—Within the past few years this vegetable has become quite popular in our market, and during the past season was very abundant and of the finest quality, but not very profitable; the price ruling very low. The season was very favorable for their growth and every one made good flowers; which has never before been the case within my recollection. The varieties are the Early Snowball, Extra Early Erfurt, Half Early Paris, and Algiers. The

Snowball will head well at any season of the year and under almost any circumstances, if it has the proper culture. The Erfurt is very similar to the Snowball; or, in other words, the Snowball is a variety of the Erfurt; as is also the Sea Foam, which I consider the best of all varieties. The Half Early Paris is but very little grown at present, the Erfurt and its varieties being so much better. The Algiers is best for late, being very large, and is most grown on Long Island.

Celery.—This vegetable has increased in use and popularity more than any other in the past ten years, being now one of the leading vegetables in our market; and no table would be considered complete without a large bunch of well bleached celery. Its cultivation requires very moist land, or a sandy loam with plenty of water for irrigation.

The kinds chiefly sold in our market are the Arlington for early and the Boston Market for late. The Boston Market is the best of the two for keeping, although the Arlington has kept very well until February. The Arlington if planted about the fifth of April will be ready for banking by the first of August, and will continue all the season. The time required to ripen or blanch the celery at that season of the year is about ten days, but as the season advances and the weather grows cooler, a longer time is required. If to be marketed at about Thanksgiving time the Arlington celery should have its first banking at the beginning of October, and the Boston Market a week earlier. It is quite a difficult matter to arrange the banking of ten or twenty acres of celery so as to have a well distributed supply all the time from the first of August throughout the season.

This crop is mostly grown after some other, affording a second use of the land the same year; in this way it can be made quite remunerative, but I do not consider it a very profitable crop at the prices which ruled during the last season. When the price will average one dollar per dozen for the season through, there is something left for the producer.

Cucumbers.—Very few vegetables are so popular, and few are so difficult to grow, as the cucumber — especially in the winter season. From seeing them exhibited on our tables at almost all seasons of the year, any one might suppose they are very easy to produce; but there are about as many failures as successes, in growing them in the winter. Many think that when cucumbers

bring twenty-five cents apiece there must be a profit, but really the time when they pay best is when they bring ten or twelve cents each at wholesale. They are cultivated in hot-beds and hot-houses. They require a high temperature; and the greatest difficulty in growing them in winter is that the temperature may chance to fall below a given point; and then they begin to show it, and decline or die; but if a high temperature is continually maintained, and proper care and a sufficient quantity of water is supplied to them, their success is almost certain.

Corn.—This crop is not very extensively cultivated by market gardeners, as it is not sufficiently profitable for growing on high-priced land. Nevertheless it is grown by them to some extent for the first early market; and more largely in the farm gardens farther away from the city. The soil should be a well prepared sandy loam, enriched by about six cords per acre of stable manure, broadcast, and about two cords applied in the hill or drill; or, if preferred, a dressing of fertilizer may be used in the hill instead of the manure; but it is always well to have some manure put on broadcast for the crop to feed on when that supplied in the hill is exhausted. Plant in rows three or three and a half feet apart, with the hills three feet apart in the row; drop five or six kernels per hill, and afterwards thin the plants to three or four; cover about three-fourths of an inch deep. Afterwards the ground should be frequently stirred by cultivating and hoeing.

Dandelions.—This vegetable is one of the earliest and best, as well as most healthful, of spring greens. The seed is sown in the early spring, and it requires the growth of all one season to establish a large root. This is left in the ground over winter for spring growing. For forcing, it may be dug up and set in rows in a hot-bed or hot-house. The plants can be brought forward for market at any time, by putting the glass on the beds, or applying heat in the hot-house. The roots are used sometimes for making beer; they are dug and dried, and are then ready for use at any time.

Endive.—This is another vegetable for which there is only a very limited demand. It is used as a salad, and by some is highly esteemed. The culture is very simple, and it will succeed on almost any good garden soil. Select if possible a spot where the plants will not be fully exposed to the heat and drought. Sow in rows, thinning the plants to one foot in the row.

It is not ready for use until it has been blanched, which is effected by tying the leaves together at the top and letting them remain for a few weeks, or until whitened.

LEEKS.—This is a somewhat peculiar member of the Onion family, and is of quite easy culture. Sow in rows or drills in April, and thin the plants to eight or ten inches in the row. As the plants increase in size they should be earthed up, so as to blanch the bulbs, which are the edible portion. They are used chiefly in soups and stews, for flavoring. There are two principal varieties, the Musselburgh Broad Flag and the Giant Carentan.

LETTUCE.—This is one of the principal crops of the market gardener, especially in the winter, and is grown very extensively in this vicinity, supplying not only our own market, but to some extent that of New York and also of Philadelphia. There are many who devote a large number of sashes to the growing of lettuce in the winter season, afterward using the glass for cucumbers and other plants in spring. There are also at the present time many houses heated by steam, or hot water, used for growing lettuce. When I built my houses it was said by some of our old and experienced market gardeners that they never would pay. But it is a noteworthy fact that today the same men have houses of their own, and use them for the same purpose.

Not many years ago it was thought that lettuce could not be raised for less than one dollar per dozen heads; but today we seldom get over seventy-five cents, and would like to have it average as high as fifty cents, for all grown under glass. That grown in the field can be raised and sold at a much smaller price, say fifteen or twenty cents per dozen.

There are but very few varieties grown here. The White-Seeded Tennisball and Curled are chosen for forcing, and the Black-Seeded Tennisball and All-The-Year-Round for out-door culture. To have lettuce the whole season, it must be sown every ten days throughout the year and twice transplanted into beds for winter; the first time four inches apart; the second time eight inches in hot-houses or seven inches in hot-beds; which will give fifty heads under each sash three feet by six. The proper distance for outside culture is twelve inches each way. To secure this, some sow the seed in rows twelve inches apart and, when the plants reach a proper size, thin them out to twelve inches in the row; but it is better to sow in a bed and transplant to the proper distance. The plants will usually make better heads if treated in this way.

MARTYNIAS.—The young seed pods of this plant are used for pickling. The plants should be fully three feet apart each way, as they are of very spreading habit.

MUSHROOMS.—This is a very peculiar crop, and one that is in many respects quite difficult to grow. The best plan is as follows:—

Take fresh horse manure and use only the finer portion of it, shaking out all the straw and coarser part. Mix this with fresh loam, one part of loam to two parts of manure, and turn every day, to keep it from burning, until the fiery heat is nearly all out of it. Prepare a bed, about four feet wide and as long as required; put in the mixture about eight inches in depth, making it very solid as it is put in. Let it remain in this condition until the temperature of the mass has fallen to ninety degrees. Then make holes two or three inches deep, at intervals of twelve inches each way, into which put the spawn, using pieces about as large as a hen's egg. Cover the spawn and let it remain for eight or ten days; then cover the whole bed with fine loam to the depth of two inches, making it firm with the back of a shovel or spade. The bed must be in a covered situation, and the prepared soil kept dry from the commencement; and must be in a dark place with the temperature at about fifty degrees.

If everything is favorable, the mushrooms will appear in six or eight weeks. As regards watering, every grower must use his own judgment.

MUSKMELONS.—This crop differs materially in culture from the watermelon, and must have land of good quality in order to succeed well, while the watermelon will produce a good crop, if properly treated, on land which most people would call poor. The muskmelon will succeed best, other conditions being favorable, on a recently turned soil. The best way is to turn the land over at the proper time and then apply about five cords of manure broadcast, using a spreader, if you have one. After harrowing thoroughly, the ground should be marked off with furrows run six feet apart each way. A shovelful of manure should be applied in each of the hills; which should be slightly raised, so that water will not stand around the plants. Seven or eight seeds should be put into a hill, so as to make due allowance for insects. After the plants have got their fourth leaf well out and have obtained a good start, they should be thinned to three in a hill. Cultivate both ways

thoroughly, the same as a crop of squashes or other vines would be treated. They should never be hoed or worked around when the leaves are wet with rain or even dew. They are a rather uncertain crop, and are but very little cultivated by our market gardeners.

In picking for market, it is an easy matter to tell when the fruit is ready to pick, as the under side of the melon will be lightly streaked with yellow. If picked at this stage it will be in good eating condition by the time it reaches the table of the consumer.

The melons of this class are all yellow fleshed. There are several varieties, but the Arlington Long Yellow is almost exclusively the one raised for our market. In shape it is oblong, skin thickly netted, flesh thick and of fine flavor. The Surprise is a variety of quite recent introduction, and of considerable merit for the home garden; but is not large enough for market. The White Japan is a quite popular sort of most excellent quality. It is of medium size, with a pale yellow skin, while the flesh is golden in color.

Cantaloupes.—The culture of this class of melons is the same as is above recommended for muskmelons, except that they are usually started under glass and afterwards transplanted, in order to hasten them along.

The Arlington Nutmeg is the leading first early variety, and is followed by the Hackensack, which is one of the most popular sorts for the main crop. The latter variety is of good size and of excellent quality. The Casaba is a large late variety, and in the Northern States requires to be started under glass in order to ripen its fruit before frost. The seed is planted usually about the first of May, and the plants should be set out in the field about the tenth of June. The bed is usually placed near the centre of the field where they are to be grown. The seed should be sown on sods nine inches square, so that thirty-two hills are started under each three feet by six sash.

The Montreal Market is the largest melon of its class now in cultivation, deriving its name from having been originated and largely grown in the vicinity of Montreal. This is started under glass earlier than the others, and is grown almost invariably in the beds until the time of picking. The flesh is green and very thick, and it is considered the best variety in existence for table use. They often bring as high as one dollar each at wholesale. As they produce more vines than the other varieties, more room must be given to them. Where one hill is planted under each sash, the beds

should be set so that the hills will be twelve feet apart the other way, and one plant per hill at this distance is sufficient. In picking for market it should be remembered that the fruit is never ripe until it will part readily from the stem.

WATERMELONS.—These are but little grown in market gardens, as, like corn, they are not sufficiently profitable. Large quantities are grown and shipped here from the South, and can be sold much lower than those raised in this locality can be.

They require warm land, and should be planted in hills eight feet apart each way as soon as the weather becomes settled—say about the middle of May. Cover about half an inch deep, and press the soil down firmly so as to hold the moisture.

The varieties are numerous. The Phinney's Early, Black Spanish, and Mountain Sprout are among the leading ones, and are as good as any.

ONIONS.—These are grown quite extensively both from sets and seed. They require a well enriched heavy loam, highly manured — say at the rate of twenty cords per acre; or, if manure is not plenty, a dressing of from a thousand to twelve hundred pounds of some good fertilizer may be made to answer a good purpose. The crop is either bunched and marketed early, or harvested at the regular time and sold then by the bushel or barrel. The principal yellow variety is the Danvers Yellow, and the leading red sort is the Red Wethersfield. The White Portugal or Silver Skin is the white variety, and is raised principally from sets and, bunched for early marketing.

PARSNIPS. — These are usually made a second crop, following a first crop of either spinach or radishes. The seed is very difficult to get up, and should be sown quite early so as to avoid drying up before it germinates. Parsnips are generally sown on ridges together with either spinach or radishes; and are put in drills fourteen or fifteen inches apart, the earlier crops being sown in rows between. These will be out of the way before the parsnips will crowd them. The ridge system has two advantages over flat culture,—first, that they seem to grow better, and next, that when left in the ground over winter they will not suffer from the water settling over them and rotting them out, as often happens in flat culture.

PEAS. — This is one of the leading first early crops of the market garden, but at present is less profitable than formerly; owing

to the fact that Southern growers ship North in such quantities as to lower prices and render the market very uncertain.

In this locality the usual practice is to let cabbages or squashes follow peas as a second crop. If squashes are to follow, the peas are sown in double rows about three and a half feet apart, alternating with spaces of about five feet in which the squashes are planted about the first of June, and in hills about ten feet apart in the row. This will be before the peas can be removed.

When peas are cultivated in this manner the earliest varieties are always chosen, as the later ones could not be got off early enough. They are usually sown about the first of April, or as soon as the ground can be worked. If later crops are desired, continuous sowings may be made every week or ten days until the first of August.

The number of first early smooth varieties is large, but in reality all the following are only selected strains of the Daniel O'Rourke, and many of them are no better — Breck's Excelsior, Seventeenth of June, Maud S., Carter's First Crop, Early Caractacus, Hero, and nearly all of the so-called "First-and-Bests" sent out by seedsmen as especially early.

Among the earliest wrinkled sorts are the Kentish Invicta and Blue Peter, but the Rawson's Clipper (which resembles the Invicta in appearance) surpasses all others in earliness, as has been proven by comparative tests the past season. The American Wonder, Little Gem, and Advancer are medium early wrinkled varieties; and these are followed in their season of ripening by the Champion of England, Blue Imperial, and Tall and Dwarf Marrowfats.

The Stratagem is fast becoming one of the leading late varieties. It is of large size, a heavy yielder, and of the best quality; and has the advantage over other varieties of being much easier to pick. The number of bushels of pods raised from a bushel of seed varies from one hundred to one hundred and fifty, and the price usually averages about one dollar per bushel.

Peppers. — This crop is but little grown in the market garden, and indeed is nowhere raised to any great extent, except in the home garden for a family supply. Those raised in the market gardens are mainly sold to the pickle factories. The plants while young are very tender, and require starting early, and careful treatment under glass. They should be treated in the same manner as egg plants or other vegetables of tropical nature. Light

sandy soil is best adapted to them, although they can be grown on almost any good land. It is advisable to delay putting out the plants in the spring until the weather becomes settled, — say about the twentieth of May. The Bell (or Bull Nose), Squash, and Cayenne are the principal varieties.

POTATOES.—These are almost entirely grown as a farm crop, so we will not give them much attention here. Their culture has been so much discussed in agricultural papers and books that it would seem as if little more could be said. Yet everything has not been learned about the crop, for we believe no one yet knows effectual preventives of the scab and other diseases which affect the tubers. And there are many points in the culture of potatoes which will no doubt be improved upon in time, so that we shall raise larger and better crops.

RADISHES. — This vegetable is grown quite extensively, being forced in hot-beds and hot-houses and, in spring time, grown out of doors. The seed is sown under glass in rows about four inches apart. The French Breakfast variety is the one chiefly raised in houses. For outside beds the Long Scarlet is sown. Sometimes this is the sole crop, and sometimes one row in three is sown to carrots, which come along after the radishes are pulled. The radishes are sown in rows four inches apart, and thinned out to two inches in the row. About three pullings are generally made, after which the carrots are large enough to thin out; and these occupy the ground until their turn comes for market. The Long Scarlet radishes are pulled when about the size of clothes-pins. They are tied in bunches of ten each, and sold by the dozen bunches.

The kinds most extensively grown in this vicinity are the French Breakfast, Scarlet Turnip-Rooted, Scarlet Olive-Shaped, and Long Scarlet. The White Turnip-Rooted and Black Spanish are grown in other places. The soil for radishes of all kinds must be quite sandy, thoroughly pulverized, and well manured.

HORSE-RADISH. — This vegetable is grown quite largely at present. It is planted in ridges; one row on each ridge, at intervals of three feet between the rows, and the plants a foot and a half apart in the row. The plants are grown from pieces of the root, about half an inch long, which must be placed in the ground about two inches deep. The ground must be thoroughly worked, free from stones, and well manured. It is usually grown for the second or third crop, before which may come spinach, or beets, or

both. Carrots some times share the space on the ridges; and some, in cultivating cabbages, place a plant of horse-radish between each cabbage and its neighbor, and so get quite a good crop; but I do not think this is as profitable a way as on ridges.

It is prepared for table use by grating up and putting into bottles. It may be either dug up with the spade, or ploughed out when as much as a row is wanted at a time; the latter is the best way, because it gets out all the roots. It is sold by weight, or in bunches, or by the barrel.

Rhubarb. — This is now quite extensively grown, both in field culture and by forcing under glass. The plants are sometimes grown from the seed; or eyes may be taken from old plants. By the latter plan one year's time is saved. They are set about four feet apart each way, on well prepared land; which should be of a light porous character. If the land is heavy it will retard the growth of the crop somewhat, and a few days' time in getting into market sometimes makes a difference of one-half in the price obtained. The stalks ought never to be pulled the first year, as it requires one year for the plants to get established.

This is one of the first out-door crops to come into market; as the first pulling is usually made, in this vicinity, about the last of April or the first of May, and the stalks continue to furnish a supply until about the first of July, or for a season of two months.

For marketing it is put up in bundles, varying in weight from fifteen to forty pounds, the weight increasing as the season advances. It is sold only by weight: the price varying from one to two cents per pound; and at this price an acre would return from three hundred to four hundred dollars. In the fall, after the tops die down, a coat of manure is given, and the following spring this is lightly turned under with a fork. It will not do to put a plough in, on account of disturbing the roots.

When the crop is forced it may be done either by taking up the plants and setting thickly in hot-beds or hot-houses, or by having the plants in the ground about three feet apart, and setting frames over them so as to force their growth. In the last mentioned method the glass is put on the beds about the first of February. The price of the forced crop varies even more than that of out-door growth, so that it would be impossible to estimate the proceeds very exactly; but five dollars per sash, three feet by six, would be a fair estimate.

The two varieties mostly grown here are are the Linnæus and Victoria; the former being on many accounts the most desirable. Like all the rest it is very early and productive.

SALSIFY. — The culture of this vegetable, although at the present time quite limited, is slowly increasing, as it seems to be growing in favor with consumers. It is as yet, however, less popular in this market than in some other places. The crop will succeed best in a light sandy loam, well enriched and thoroughly worked before sowing. The method of culture is almost entirely the same as for carrots or parsnips. The seed should be sown as early as the ground can be worked; and the roots will be ready for marketing the following fall and during the winter and spring; but the winter supply of course has to be dug and stored before the ground freezes up, although the roots are not injured in the least by freezing, and may, if desired, be left in the ground over winter, and dug as soon as the frost is out in the spring.

In marketing the roots are tied in bunches of twelve each, none but well-shaped roots being used.

There is but one variety, although there is much room for improvement in size and smoothness of root.

SPINACH.—This is becoming one of the leading crops of our market gardens, being in use during the whole of the year. The winter supply, at present, is usually brought from the South; but formerly it was stored during the winter season, and marketed as required.

The crop that comes early in the spring is commonly sown about the first of September, and at the approach of winter is protected with a covering of hay or boughs. This covering being removed as soon as the frost is out in the spring, the spinach will start almost immediately. When cultivated in this way, it is usually ready for cutting about the middle of April. This crop generally lasts until about the first of June, when that which has been sown in the spring will be ready for marketing.

The receipts per acre vary greatly, as the price obtained depends altogether upon the supply. It is sold by the bushel. The receipts from an acre, in a season when the yield is generally large, will probably be about two hundred dollars; in a year when the general crop is a short one, they may reach as high as a thousand dollars.

It is sown on beds about twelve feet wide; ten rows being put

in each bed. The purpose in view in sowing on these beds or ridges is to prevent water from settling on the plants; as it would kill them out. The sowing is done with a seed drill. About eight pounds of seed of the Arlington, or ten pounds of the spring variety, will be required for an acre.

For spring culture, it may be sown in almost any convenient manner; either as a separate crop or with other crops. Frequent sowings are usually made, with a view of furnishing a continuous supply.

The crop will bear a liberal amount of manure, and for the fall sown crop a dressing of about seven hundred pounds of sulphate of ammonia is usually given in the spring.

For the first spring sowing the Round Thick-Leaved is generally used. For later crops the Long Standing is preferable, as it will not go to seed in summer weather as quickly as the Round Thick-Leaved.

For either the fall or spring cutting, the Arlington or Pointed-Leaved is the favorite sort, as it is very hardy, and is better liked in the market than the Prickly-Leaved, which is sometimes sown.

The Savoy-Leaved is a curled sort, and is not only very ornamental in appearance but of good quality. This is a very desirable variety for the home garden.

Squashes. — These are quite extensively cultivated; both independently, and as a crop to follow one that is earlier removed. They are often planted with a crop of peas, the plan being to leave out every third row of peas, thus providing a space of five feet in width in which to plant the squashes; putting the hills ten feet apart in the row. The peas will be off the ground before the squash vines are large enough to be in the way.

When planted alone they are put in hills ten feet apart each way, and unless they follow a crop which has been heavily manured it is necessary to apply a dressing broadcast as well as in the hill. If the borers are ever troublesome, mix a shovelful of coal ashes in the soil with the hill, and there will be no injury from them. It is not best to plant the general crop for winter supply much before the first of June, but the Marrows for early use are often planted as early as the last week in April, being protected with boxes until the weather becomes warm and settled.

For the summer supply, the White Bush Scallop and the Yellow Summer Crookneck are the principal varieties. For early fall and

winter use the Marrow has no equal, while the Hubbard is the standard hard shelled winter sort. The American Turban is also quite popular. But the Essex Hybrid is just as good in every particular, and has the advantage of being hard shelled, like the Hubbard, and consequently keeping better than the Turban.

TOMATOES.—This is a crop which is now very extensively grown. With the great increase in its consumption which has occurred within the past few years, there has been a corresponding improvement in varieties; not so much in respect to earliness, perhaps, as in size and quality. Certainly there can be no garden product much more perfect and handsome than the well ripened fruit of some of our leading varieties.

The tomato is in most respects of easy culture, although it requires some care, and a good deal of labor and expense, to get the plants properly started in the spring.

For the early crop the seed should be sown in a hot-house or hot-bed about the middle of February, and after reaching sufficient size the seedlings should be transplanted to four inches apart; in in order to induce a stocky growth. The second transplanting should be made before the plants commence to crowd and grow spindling, and this time they should be set eight inches apart. This last transplanting before their final removal to the open ground is always made in hot-beds; but where the seed is started in a hot-house the first transplanting is usually made in the house, and the plants are allowed to remain until removed to the hot-bed. At the second transplanting, about the twenty-fifth of May, the plants may generally be set in the open ground, and should be planted in rows six feet apart, with plants five feet apart in the row.

Tomatoes are usually planted to follow a crop of spinach, and but little more manure is applied except in the hill, for which two cords will be sufficient, and will push the crop along wonderfully. Five or six cords per acre is usually put on where the crop does not follow spinach. Clean culture should of course be given.

In this vicinity the first picking is often made by the middle of July, and at that early date usually brings a good price, sometimes as high at ten dollars per bushel; but the price soon falls, and often gets down below a paying rate. The price varies greatly, but on an average the proceeds of an acre would amount to about six hundred dollars.

The varieties are numerous, but there are few of real superi-

ority. The Cardinal is a promising sort, of recent introduction. It is early, of large size, very smooth, and in every way desirable. The Acme was for a time a leading sort; and, although it rots badly, is very desirable where it can be grown. The Mayflower is highly recommended as a very early, smooth sort, equally desirable for market or home use. Livingston's Favorite and Perfection are two most excellent sorts, and are both good shippers, and not liable to rot or crack. The Emery is the first early market variety. It is of good size, and, considering its earliness, is of good quality; but of course the very early sorts cannot be expected to be as solid as the later varieties.

There are numerous other sorts, such as Canada Victor, Conqueror, Hathaway's Excelsior, Essex Hybrid, Trophy, and others; but those described are the leading ones.

TURNIPS.—This vegetable is not very extensively grown for market, except the strap-leaved varieties, which are quite largely used for bunching, and are also desirable for fall and early winter use. The Swedes and Ruta-bagas are mostly raised as a farm crop.

WATER-CRESS.—This is but little grown, as the demand is very limited. It is raised on very moist land, along the borders of marshes or streams, and is sold in our market in bunches, being used as salad.

I have now gone through the list of garden vegetables; though in a somewhat hurried manner, and mentioning only a very few points in connection with each. All vegetables offered in market require considerable care and attention—some more than others, and success in growing and disposing of them requires an observance of all the points mentioned, and many more, too numerous to notice at this time.

The progress in vegetable culture has been very great in the past ten years, as our exhibitions have abundantly shown. But there is still room for improvement; and with the accumulated knowledge of the present day, the many kinds of fertilizers, the better machinery and tools, and the great improvement in varieties, there is every opportunity for the production of better vegetables than ever before, and time only can show what further results will be attained.

Discussion.

William D. Philbrick inquired of Mr. Rawson what he considered the best manure for early cabbages.

Mr. Rawson replied that he used commercial fertilizers liberally in addition to barnyard manure. He never knew fertilizers to do any harm.

In answer to a question as to the quality of the Trophy tomato, Mr. Rawson said that it is hard round the stem and is objected to by the pickle makers for that reason, but it is a good variety for a family garden.

In answer to a desire for further information concerning cauliflowers, he said that they will absorb a great deal of manure; he never knew them to get too much. Last year they were very successful; if there was anything to object to it was that they grew too well; everybody had them, and they were too cheap. They are sold by the pound to the pickle factories; they began at four cents and fell to two and a half. They are composed of about seventy-five per cent water, and it requires a great deal of moisture to cultivate them successfully. The year before last he had six acres from which he sold $3,500 worth of cauliflowers; he devoted his steam pump to them, running it continuously for four weeks, with two men by day and two to relieve them at night. If he had not irrigated them the crop would not have brought more than $1,000. In irrigating, he first ploughs the land into ridges, and runs the water in the channels thus formed between the rows, about once in a week or ten days. Cauliflowers do not show the effect of dry weather until they are about to head, and if there is danger of a check then the application of water will cause them to go right on. Poor crops come from the lack of manure or water, or from poor seed. The variety selected makes some difference; the Early Paris is good, but if it grows large it becomes loose. The Erfurt is very solid, and will grow in all situations, and not one in a hundred will miss heading. Last year he raised fifteen varieties, and found two or three Erfurts very fine and free from mixture, which he saved for seed. Cauliflowers are grown very extensively on Long Island; the Algiers is the variety chiefly cultivated there; it attains the weight of from ten to twelve pounds, but requires a season four or five weeks longer than other kinds. Cauliflowers are attacked by a small black flea as soon as

they get out of the ground; the only remedy is to drown them out by sprinkling freely three times a day with a hose until the plants get three or four leaves. Owing to the ravages of this flea he had frequently sold plants to cultivators to whom he had previously sold seed. He had sold cauliflowers from under glass for four dollars per dozen.

Mr. Rawson said that he knew of no remedy for the cabbage maggot, but the cabbages will recover from the injuries caused by it. He recommended to heap the earth round the cabbages by means of a plough and hoe, and then tread it down, half-covering the head. He had known a crop saved in this way after the first of July.

He transplants all his celery; he sows in drills only to raise plants for sale. He sows in the shade of a fence, digging the ground lightly and treading it down hard; then he rakes it so as to make the surface very fine, sows and covers very lightly, and waters frequently. It should have sun half the day. It may be sown on the north side of a fence used for protecting hot-beds; he takes down his fences about the time the celery plants come along.

A paper by Edward L. Beard, on "The Progress of Orchid Culture in America," was announced for the next Saturday.

BUSINESS MEETING.

SATURDAY, March 6, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

Hon. Marshall P. Wilder, President of the American Pomological Society, presented a copy of the Proceedings of that Society at its Twentieth Session, September 9–11, 1885. Mr. Wilder said that he had great pleasure in doing this personally. When President of our Society, he was authorized by it, as Chairman of a Committee in connection with Committees appointed by the Pennsylvania, New Jersey, and New Haven Horticultural Societies, and the Board of Agriculture of the American Institute, to

call a convention, which, from this small beginning, ultimately grew into the American Pomological Society, extending over not only our own country but the British Provinces. He rejoiced that he had lived to see the progress, to their present advanced position, not only of our own Society but of its child, the American Pomological Society.

The thanks of the Society were voted to Mr. Wilder for his donation.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society: —

NATHAN D. HARRINGTON, of Somerville.
P. M. AUGUR, of Middlefield, Conn.
PROF. CHARLES L. JACKSON, of Cambridge.
DR. GEORGE E. FRANCIS, of Worcester.

Adjourned to Saturday, March 13.

MEETING FOR DISCUSSION.

THE PROGRESS OF ORCHID CULTURE IN AMERICA.

By EDWARD L. BEARD, Cambridge.

As compared with the few who have a knowledge of the structure, formation, and habits of the wonderfully varied class of plants known as Orchids, the majority have so slight if any knowledge of them, that it will be proper at the outset of this paper to state, as briefly as possible, the peculiar characteristics to which they owe their distinct isolation from all other classes of plants. While the Orchidaceæ are scattered throughout the world— their more marked and beautiful forms being chiefly centered in a belt of territory embracing the tropics, with scattering examples in the temperate zones—and while the various species and their flowers are marked by the strangest peculiarities of growth, form, and color, its classification as a family, in a botanical sense, is due to the singular formation of the organs of reproduction; which are more or less the same in every species, no matter how widely separated from one another as to geographical location, or as to formation or color of flower, or growth of bulb or stem. These peculiarities need not be stated in detail, but only in a general way, to distin-

guish the family from others whose flowers possess in common the same facilities for reproduction, and bear the stamens, pistil, pollen, etc., in a more familiar shape. Lindley's description of the Orchid family, in a botanical sense, is as clear and concise as any which can be given. He says: "The order owes its chief peculiarities to the following circumstances: firstly, to the consolidation of all the reproductive organs, such as the pistil, stamens, etc., into one common mass called the column; secondly, to the suppression of all the anthers except one in the mass of the order, or two in Cypripedeæ; thirdly, to the peculiar condition of its pollen, which instead of the typical powder takes the form, in most cases, of a waxy mass; fourthly, to the very general development of one of the inner leaves of the perianth, or petals, in an excessive degree, or in an unusual form." As an instance of this, we have the gay lip of the Cattleya, or the upright banner of the Cypripedium.

Another notable fact, connected with this family, is the singular inability of the flowers of orchids to fertilize themselves as in the case of other families. Owing to their peculiar construction, they depend upon the efforts of insects for the transfer of pollen from one to the other, and in some species, like the Coryanthes, the insect which attempts a visit to the flower has a strange process to go through before he can be liberated with the pollen.

There are some exceptional species like certain of the Cypripediums, Phaius, and others of that class which grow in the ground, or on rocks near the ground, but by far the greater number of orchids are epiphytal in character,—that is, they grow upon stems or branches of trees, at greater or less elevation from the ground; and I may at this point correct the popular impression that the Orchid is a parasite because of its habit of growth. It is not a parasite in any sense, as it takes no life from the branch upon which it grows, but draws its main sustenance from the air and moisture which surround it, its roots also taking some slight nourishment from the layer of vegetable *débris* or fibre which generally accumulates upon the limbs of trees in the tropics, where decay is rapid. In that region, the finest orchids are often found in the tops of the highest trees, and at such an elevation that it is almost impossible to secure them except by cutting down the tree, or by engaging the services of expert native climbers. Collectors and travellers tell us that in journeying through the habitats of orchids, few are seen in the lower shades of the forests; which are singularly bare of that

wealth of bloom popularly supposed to be their chief characteristic. Perched high in air, and shaded by the foliage of the tree upon which it grows, the Orchid finds its home; and the perilous experiences of collectors in their attempts to find the location of some new and rare species, of which little had previously been known, would fill many volumes. Instances are not uncommon of expert collectors having been sent thousands of miles across the ocean, to some remote portion of South America, India, or the Malayan archipelago, to secure some special orchid, of which a specimen or two may have been previously gathered and brought home. Most of these expeditions have proved successful, while others have failed, and many valuable lives have been sacrificed in the unhealthy climates of the tropics. In addition to these perils, millions, I may say, of plants have been lost in the effort to bring them from the far distant interiors to the sea-coasts, and thence to their destination. Many localities in South America, and other countries, have been so thoroughly stripped of choice species and varieties of orchids, that few of them are now to be found in those particular places; though it must not be inferred that the supply of other species from other localities is exhausted. Orchids in their home fortunately form vast quantities of seed; and these germinate freely and form the basis of a new supply, if the process of collection is not carried on too closely year after year in the same localities.

It is worth while in this connection to refer to the fact that, in some portions of South America, an export tax is hereafter to be levied upon all shipments of orchids; and it remains to be determined whether this will in any way affect their indiscriminate destruction, or increase their value. The process of raising seed in our own glass houses is too uncertain and tedious, and requires too great skill and patience, to warrant the belief that any large supply will result from this source.

I may depart, for a moment, from my subject, to show what patience is required to raise orchids from seed under glass, even supposing the skill attained that is requisite to hybridize the orchid flowers, and to sow and raise the seed, which is a very delicate process, orchid seed being as fine as dust. Dendrobiums have been flowered in from three to four years from the date of sowing the seed, and the ripening of the seed consumed an additional year; which is about the shortest period of germination and growth

known. Masdevallias occupy from five to six years before they are strong enough to flower. The majority of other Orchids, however, occupy longer periods than this; while Lælias and Cattleyas are from ten to fourteen years in germinating and reaching the flowering state. Examples where nineteen years have been consumed are recorded. A large proportion of the seed sown under glass never germinates, notwithstanding the exercise of the greatest care. Thus it will be seen that the cultivation of orchids from seed is an undertaking surrounded by difficulties almost insurmountable except by those who have exceptional skill and patience, and are willing to wait half a lifetime for results.

Such a man was John Dominy, of England, who in 1853 began the hybridization of orchids at Exeter, and continued his efforts for a long period, producing in his time some very remarkable hybrids, all of them marked by increased vigor and bearing the characteristics of the parent plants in an improved degree. I do not know how many seedling orchids Dominy raised altogether, but those deemed worthy to receive names were twenty-six in number. Mr. Dominy's first hybrid orchid that flowered was *Calanthe Dominii*. The first hybrid Cattleya was *C. hybrida*, which was afterwards lost, but was soon followed by *C. Brabantiæ*. The well-known *Cypripedium Harrisianum* was the first hybrid of this genus flowered, and was named after Dr. Harris, who had first suggested to Dominy the possibility of artificially crossing orchids.

Mr. Dominy's work closed some years ago, as he had grown desirous of leaving it to younger hands, and it was taken up by Mr. Seden, who in 1866 commenced his labors at the same nursery, and has progressed uninterruptedly in this interesting pursuit ever since, producing about fifty-six hybrid forms of orchids; and it is safe to say that large numbers of his seedlings have not yet been flowered, and remain in reserve to delight the orchidologist of future years. Seedling orchids have been raised in other foreign gardens; the magnificent *Dendrobium Ainsworthii* being the result of a cross in Dr. Ainsworth's collection at Manchester in 1874. There have been scattering examples in other gardens, and a few seedlings have been raised in this country, but these were not perpetuated. The cool orchids, such as Odontoglossums, though seeding freely in

their own country, have never been successfully crossed, and we have no artificial hybrids in this large section of the Orchid family. The hybrid orchids which have been produced by artificial fecundation, and which have been put into commerce so far, or named, number about eighty-eight, and they are divided nearly as follows: Anæctochilus, one; Calanthe, five; Cattleya, seventeen; Chysis, two; Goodyera, two; Dendrobium, eight; Cypripedium, thirty-nine; Lælia, eight; Masdevallia, two; Phaius, two; Thunia, one; Zygopetalum, two. It will be noticed that the most numerous progeny of the hybridizer's skill are among the Cypripediums, and next among the Cattleyas. There is every reason to believe that sooner or later crosses will be made among the Odontoglossums, the Phalænopsids, and other genera which have hitherto failed to produce seed, or whose seed when produced has failed to germinate. One of the reasons given for failures to get good seed in England is the absence of strong sunlight; and, as we have ample quantities of almost tropical sunlight in this country, there is ground for hoping that hybridizers on this side of the water may succeed in making crosses which have not hitherto been accomplished; though whether the patience necessary for the subsequent development of the seed into growth, and the plant into maturity, is possessed by our horticulturists, remains to be proved.

In summing up the general results of orchid-raising from seed, with its attendant care, watchfulness, and long waiting, it may be questioned whether it will ever prove in the popular sense a profitable undertaking: more probably we must depend for our supplies upon Nature's own handiwork amidst the forests of the tropics, where orchids are at home.

It is but a few years ago that the great family of Orchids, with its members represented in nearly if not quite all the temperate as well as the tropical countries of the world, was comparatively unknown among the flower growers and flower lovers of the United States; and even at the present time the great mass of intelligent people have but a vague and indefinite idea of the habits and wonderful variations of this family of plants; and of its startling eccentricities of growth and flower. This is not more remarkable, however, than the superficial knowledge of the mass of people concerning the more common flowers; which, indigenous to their own State or County, and springing up under their very feet, are rarely known by name or regarded with more than passing interest. It

is pleasing to note an increased desire among intelligent and refined persons to know more about our native flowers and their names and habits; which may be accepted as one of the best evidences of growing civilization. It is only among the oldest as well as the most progressive nations, that the highest type of horticultural taste can be found.

This growth of interest noted above has extended to the Orchid family, and it is noticeable that crowds of persons are invariably attracted to the brilliant displays of these plants in flower at the various exhibitions of this Society; to the neglect, it must be confessed, of many more common plants which at least have the advantage of being more graceful in leaf and stem; for, with a few exceptions, such as the stately Angræcums, Vandas, Cymbidiums, and some others, the Orchids are not attractive when out of flower, except to the connoisseur or expert. To these the Orchids are objects of fascination and deep interest, whether in flower or not; and immense sums of money are spent in forming collections of the rarest varieties obtainable. It would be interesting to consider some of the expenditures which have been made by collectors from time to time for unique specimens of orchids. An example of this may be noted in the alleged sum of $3,000 paid for a single plant of *Vanda Sanderiana* by the late Mrs. Morgan of New York. There is some doubt expressed as to the truth of this, but, if true, it was a notable case of what I might denominate extravagant expenditure; and we know she never hesitated to pay the price for any special orchid which she desired to possess. I knew of one mass of *Odontoglossum Londesboroughianum*, covering a space about the size of a door, which cost her a thousand dollars, but a year or two later it had entirely disappeared through faulty culture. In her collection were magnificent specimens of such "miffy" subjects as Batemannias and Bolleas, which cost several hundreds of dollars each, and these too were lost. Mrs. Morgan undoubtedly paid higher prices for orchids than any other buyer in this or any other country, but her purchases were not marked by the wisest judgment, and so when her immense collection came to the hammer it did not bring anything near the original cost. Some years ago a single plant of *Cypripedium Stonei platytœnium* brought about $1,200 at a sale in London, and prices approximating this figure have since been paid for specimens of newly discovered species at once rare and beautiful.

In this country, where the cultivation of these plants is not so general as in England, prices for imported orchids have not ruled high, but it is noticeable that within the past year the rage for orchid flowers has tended to increase the demand for plants and enhance their value. It is not probable that the prices of good orchids will ever rule lower than at present; while for fine varieties of species connoisseurs are always ready to pay fancy prices, one plant of an exceptionally fine variety bringing twenty times the cost of an ordinary variety of the same species. A large number of the orchids in this country were imported from England, where there are large horticultural establishments, one of which has employed from ten to fourteen men at one time collecting orchids in the tropics. The collection of orchids in this way has been noticeably increased within the last five or seven years. As a consequence, many species which cost large sums of money are now worth much less, but, as I have stated, the price of good orchids is about at its lowest ebb, and there is likely to be an upward turn.

The sale of orchids by auction in New York has also increased largely within the last five years, most of the plants sold in this way being newly imported ones; and thousands of these are sold by one firm from April to November, about twelve to fifteen sales taking place in this period. In their auction room, which is the haunt of most of the orchid growers, may be found hundreds of imported orchids just as they have been gathered from the trees; and very dry, uninteresting, and valueless they appear to the uninitiated, but the expert in such matters can tell at a glance the value or quality of this or that shrivelled clump of bulbs, which, under conditions of moisture and warmth, will soon plump up and start into growth. The competition among growers for these dry bits is often spirited when some especially rare variety is offered, and I have seen from $50 to $75 offered for what most persons would have consigned to the rubbish heap; but, under care and cultivation, this in a year or two was likely to be greatly increased in value over the first cost, though it must be added that many imported orchids never recover after removal from their native haunts, and die in spite of the most skilful culture. No collection is exempt from losses in this way, even established plants dying off mysteriously, and without apparent reason; yet the majority of orchids are hard to kill, and with proper cultural conditions they are no more difficult to grow

than many other plants. Ample moisture in the growing season, atmospheric moisture being absolutely necessary, cleanliness, fresh air, and (except in the winter time, from December to March, when most orchids rest), a clear bright light without exposure to the direct sunlight, are the essentials of good culture; but I will refer to this later.

Thousands of the "cool" orchids from the high mountains of South America have been destroyed, in this country and in England, by the application of too much heat. Many of these cool orchids come from altitudes ten and twelve thousand feet above the sea level—regions of perpetual moisture, and where ice forms—so that our tropical summers combined with overheated glass houses in winter have swept them off in large quantities. But the culture of this class of orchids is now understood, and, as a proof of this, at Mr. Ames's place at North Easton may be found a house over one hundred feet in length, facing the north, and containing, I think, the finest grown lot of cool orchids in this country. This house is always cool and moist, in summer as well as winter, and the conditions which surround these plants at home are well imitated.

These, superficially stated, are some of the features of general interest peculiar to orchids; though pages more might be written, full of interest even to the novice. There is no denying the peculiar fascination which surrounds orchid culture. The strange forms of the flowers, displaying in every species more or less divergence from those of others, the fantastic habit of growth, the undeniable beauty of most of the flowers, and, not least, the fact that the plants are comparatively rare and expensive, and consequently not likely to become common—all these are reasons for the enthusiasm which characterizes the orchidist at home, as well as abroad.

The growth of Orchids was attempted abroad years before any attention was given them in this country. In the records of the Botanic Garden of Harvard University at Cambridge, Mass., mention is made of a single orchid which the garden possessed in 1818. It was the well-known *Phaius grandifolius*, still grown in many collections. The first orchid exhibited in this country, of which we have any record, was *Oncidium flexuosum*, still a favorite, and a good orchid. This was shown by Marshall P. Wilder before the Massachusetts Horticultural Society, June 24,

1837. In September, 1849, James Dundas and Robert Buist were awarded the first and second prizes for orchids exhibited before the Pennsylvania Horticultural Society at Philadelphia; but the species are not named. We find the first trace of any orchid collection, in America, in Boston about 1837—John Wright Boott, whose garden occupied the ground where the Revere House now stands, owning a small lot of orchids sent from England. This collection was scattered, but in 1846 Caleb Cope of Philadelphia, who still lives, had a greenhouse devoted to orchids. He was also the first to flower the *Victoria regia* in this country.

In the meantime small collections of a few species had grown up around Boston, and in 1854 Edward S. Rand owned what was considered, at the time, a fine collection, and many of the plants were specimens of considerable size. Previous to 1850 Erastus Corning, of Albany, N. Y., owned some orchids, such as Phaius, Cypripediums, Cattleyas, Epidendrums, and a few other genera; and about 1850 he brought from England thirty species of orchids, including Vandas, Aërides, etc., and thus laid the foundation of his wonderful collection, which today is, without doubt, the finest in America, and one of the best in the world. Isaac Buchanan of Astoria, L. I., long known as one of the earliest florists in this country, who still lives, and whose love for orchids continues as keen as ever, brought *Cattleya Mossiæ* from England in 1840, and gradually increased his collection until, about 1860, he had a large number of plants. Mr. Buchanan never lost an opportunity to add to these, and (although buying and selling continually) he had as many as 2,000 orchids in his collection at one time, and probably many more than that number. His collection was largely dispersed some time ago, though he still retains some of his plants. Thomas Hogg maintained a fine collection near New York about 1850, but this was dispersed some years later. The collection of Cornelius Van Voorst, of Jersey City, was a noted one in its day, and doubtless the best in this country at that period. It existed from about 1857 until 1870, when it was broken up. M. Lienau, of the same city, owned, after the dispersion of Van Voorst's collection, the best lot of orchids in this country, but in 1873 this was also dispersed, part of the plants being taken to Germany by Lienau, and the rest of them being sold at auction. There were a number of other orchid-growers in this country previous to 1860 — among them Gen. John

F. Rathbone, of Albany, N. Y., who founded his collection about 1853, and still maintains it in fine form. Louis Menand, of Albany, was another. He had a few species as early as 1846, and has kept pace with the progress of their culture, and is considered, with Buchanan, amongst the pioneers of orchid-growing in this country. One of the most enthusiastic of our American orchidists was Edward S. Rand, Jr., who, leaving Boston some years since, settled in South America, where he gave much attention to collecting orchids, and made some experiments in growing the Indian orchids, such as Phalænopsids, Vandas, and Aërides, upon the trees and trellises surrounding his dwelling at Para. His collection near Boston, started in 1873, was an exceptionally good one, embracing fine specimens of nearly every species then introduced. His work on Orchid Culture embodied some valuable information, especially on points relating to orchid culture in this country. Mr. Rand's collection was kept up for a short time only, most of the valuable specimens going to Mr. Frederick L. Ames, of North Easton. From about 1865 up to the present time, orchid growing in America has been more general, and is now widely diffused over the country; so that, in place of the dozen or fifteen collections kept up twenty years ago, almost entirely in the Eastern states, we find good collections scattered all through the Northern states, and in Canada. Many of these collections number from one thousand to one thousand five hundred plants, and are rich in fine varieties and large specimens.

The most rapid growth of the orchid fever has, however, been within the last ten years. Within that period, English nurserymen have enormously increased the importations from the tropics, and as a result of the activity of their trained agents, most of them experienced botanists and familiar with the orchid family, unexplored sections have been penetrated, and hitherto unknown species brought to light. Many more exist which collectors have not found, or, having found, have not succeeded in introducing alive. An estimate has been made by good authority that not less than five thousand species exist, of which two thousand have been, or are, in cultivation. In the former part of the statement there is much of conjecture, but in regard to the latter there is no doubt. Discoveries of new orchids of very prominent distinctiveness are likely to continue as long as indefatigable collectors are kept at work in the tropics, urged on by the desire of

orchid fanciers for new varieties which shall outrival any of those previously brought into cultivation.

It would be interesting to review thoroughly the immense quantity and variety of new Orchids introduced since 1875, but the lack of space will not permit this to be done; suffice it to say, however, that since that year such Orchids as *Vanda Sanderiana*, *Odontoglossum cirrhosum*, *Bollea cœlestis*, *Aërides crassifolium*, *A. Lawrenceæ*, *A. Sanderianum*, *Cypripedium Lawrenceanum*, *C. Spicerianum*, *Cattleya Lawrenceana*, *Cymbidium Lowianum*, *Dendrobium superbiens*, and hosts of new Masdevallias (a genus, by the way, which in 1830 was thought to have but three species) have been discovered; besides unlimited numbers of varieties of species, like *Odontoglossum crispum*, *Cattleya Trianæ*, etc. When we look over such a collection as that of Corning, at Albany, and find there alone over eleven hundred species, assembled from every part of the tropical world, with additions constantly coming, the contrast with the dearth of orchidaceous knowledge in 1830, fifty-five years ago, is startling; then —as Lindley puts it—"the orchidaceous plants of tropical America were scarcely known either in gardens or herbaria; those of the Philippine islands were unheard of; and the numerous Javan species were only puzzles which the Dutch had the means of unravelling."

The increase of trade collections in America has not been in proportion to the growth of collections owned for private use or pleasure. As stated previously, Isaac Buchanan, Louis Menand, and Robert Buist were the first to take up the growth of orchids in a commercial way; and no doubt even they were impelled to it more by a personal interest in Orchids than by any hope of great gain. Mr. Buchanan has a small collection left, but he does not give that space to orchids which he formerly did. American florists, with one or two exceptions, have found it difficult to keep up a profitable trade in orchid plants, owing to the competition of English nurserymen, and the large auction sales in New York. Mr. George Such, of South Amboy, N. J., had the finest trade collection ever maintained in this country. It embraced fine specimens bought from private collections, many of the best plants from the Lienau and Van Voorst sales having been added to it. Mr. Such imported largely direct from Mexico, South America, India, and elsewhere. Thousands of valuable orchids

were sold from this establishment, many of them particularly fine varieties, which are difficult to duplicate now. Mr. Such's greenhouses were resorted to by all orchid growers. They were doubly attractive because always neat and clean; and the dispersion of his collection by auction about three years ago was an era among orchidists. There were over four thousand five hundred plants disposed of, and over twelve thousand dollars was realized at the sale.

Mr. Menand, at Albany, N. Y., has about four hundred and fifty species in his collection, where they are associated with other plants, such as camellias, cacti, etc., while many are grown in the open air in summer. He grows some kinds to better advantage than almost any other cultivator in this country. A. F. Chatfield, of Albany, maintained a trade collection for years, and imported and disposed of many fine plants; but I do not know whether he still keeps it up to any extent. William Matthews, of Utica, N. Y., is getting together a good trade collection.

The largest collection of orchids kept for sale purposes is probably that of A. Brackenridge, at Govanstown, Maryland. This gentleman a few years ago started as an amateur with a few plants, but now has four houses devoted to them, which he states contain sixty thousand plants. He grows the best known kinds, which amateurs would most easily succeed with; and has met with remarkable success in disposing of plants all over the Union. During the past year he has disposed of over six thousand *Lycaste Skinneri* alone. He has collectors in the tropics, and proposes to import largely of the Mexican and Central American orchids. He does not deal in specimens, but in the smaller plants which find more ready sale to small growers.

John Saul, of Washington, D. C., started his trade collection in 1879. He has been a large importer, and his houses, three in number, each 100 feet long, contain nearly 10,000 plants. In his collection are 3,000 Dendrobiums and 1,000 Cypripediums, besides Cattleyas and all the better class of orchids. The number of species and varieties approximates 600. In the warm climate of Washington the Indian Orchids flourish exceedingly well, but it is very difficult to keep the cooler orchids during the summer in a proper state of health. There is no trade or amateur collection south of Washington of which I have any knowledge, with the exception of a small one owned by Dr. Richardson, at New Orleans.

William C. Wilson, of Astoria, L. I., is another commercial dealer in orchids, and also transacts an immense business in other plants. He started as early as 1870 to increase his stock of orchids, and since that time, he writes, he has disposed of from 40,000 to 50,000 plants of different varieties. He now has from 300 to 400 different varieties of the most popular kinds, and grows them largely for supplying cut flowers, which within a year or more have become fashionable, and are in great demand. Another promising commercial grower is Henry Siebrecht, of New Rochelle, N. Y. His collection was founded about three years ago and has made rapid growth. It now numbers about 3,700 plants, comprising 1,500 Cattleyas, 400 Lælias, 500 Cypripediums, 500 Aërides, Vandas, Saccolabiums, etc., and 400 Odontoglossums, with miscellaneous kinds making up the remainder. Among these are fine specimens of valuable kinds, and the plants are well grown.

One of the best lots of orchids around New York is that owned by John S. Bush, at Tremont, N. Y. The plants were in a very robust state of health when I last saw them. There are here about 2,300 plants, of which 398 are Cattleyas, 357 Dendrobiums, 200 Phalænopsids, 271 Cypripediums, 134 Vandas and Aërides, 662 Odontoglossums, 100 Calanthes, 70 Cœlogynes, etc. William Bennett, of Flatbush, L. I., has a collection of orchids for trade purposes; but I do not know how large or valuable it is.

There are few commercial places around New York where some orchids are not grown; but the above collections are the only ones I know of which are large enough to be noted. Benjamin Grey, at Malden, in this State, has a large span-roofed house about 100 feet long devoted to orchids. Here he has about 3,000 plants, made up of 17 species of Cattleyas, 27 of Cypripediums, 36 of Dendrobiums, 13 of Epidendrums, 12 of Lælias and about 50 other genera; in all there are over 200 species and varieties. Mr. Grey is an orchid grower of long experience and his plants are cultivated for the flowers only, no plants being sold. The plants here are grown without any shading whatever, and in consequence are very free bloomers.

In New York city more particularly, orchid flowers have become so popular that the few who grow them find it difficult to meet the demand. A year ago they were not in such request, and though the present demand seems to be confined to New York, the

rage for them as they become better known and the supply increases is likely to spread to other cities. The kinds which are most profitably grown for trade purposes are—*Cattleya Trianæ*, *C. Mossiæ*, *C. Mendelii*, *Cœlogyne cristata*, *Lælia anceps*, *L. autumnalis*, *Cypripedium insigne*, *C. Spicerianum*, *C. Harrisianum*, *C. villosum*, *Lycaste Skinneri*, *Odontoglossum crispum*, *O. Pescatorei*, *O. Rossi major*, and *Dendrobium nobile*. Many more can be added to this list, but good collections of these kinds, well grown, are more profitable than mixed collections of less reliable and more expensive varieties. If the present demand for orchids proves to be a steady and growing one, their cultivation for cut flowers on a large scale will prove profitable. Florists in the vicinity of New York judge that the fashion for orchid flowers is in its infancy, though it must be confessed it is confined almost entirely, at present, to the ultra fashionable society of New York, where a craze is often as ephemeral as it is sudden.

There are but two botanical gardens in the United States that maintain collections of orchids. That at Cambridge, Mass., before referred to, had the honor of growing the first orchids of which we have record in this country, away back in 1818. This garden has held many fine plants in its time, but they have not always been successfully grown; and many rare and valuable kinds have been lost through bad treatment. With the present new houses well adapted to them, and with treatment on the part of the present gardener, W. A. Manda, calculated to insure a robust growth, the collection is decidedly improving. In 1883 it contained 273 plants and 167 species and hybrids; but now, only three years later, the garden has 828 plants in 378 species and hybrids. There are a stove, an intermediate, and a cool house devoted to them.

The United States Botanic Garden at Washington, under the care of William R. Smith, dates its collection of orchids from 1852, when there was a small lot grown. *Aërides odorata* and *Vanda teres* were grown there as far back as 1855. The collection of 120 species remained stationary for a long time, but has been increased in later years until it now embraces 52 genera and 247 species and varieties. There are 32 species and varieties of Dendrobiums and 22 species and varieties of Cypripediums. The collection contains some fine groups of Cattleyas, etc.

The private collections of this country which are suffi-

ciently extensive to warrant specification are about twenty in number; but there are many other small lots scattered in different parts of the country, and grown by amateurs who have just started in orchid culture. First among the private collections is that of Erastus Corning, located at Albany, N. Y. This was begun about 1850, and its growth has been constant ever since, and now, though closely rivalled by two others, it has no equal in this country; and I regret that I have so little space to describe it. Nine houses are devoted to the orchids, to wit: a Cattleya house, 100×20 feet; Cypripedium house, 50×17 feet; Dendrobium house, 60×22 feet; Oncidium and Lycaste house, 60×22 feet; Phalænopsis house, 50×22 feet; Vanda house, 40×17 feet; a north or cool house, 36×12 feet, devoted to Masdevallias, and another cool north house, 60×12 feet, for Odontoglossums. There is, in addition to these, a resting house, 30×17 feet, where deciduous orchids which need a long period of rest, during which they are kept dry and cool, are housed. A house of this character is a necessity where a large collection is grown, and here are kept such things as Bletias, Cynoches, Mormodes, Dendrobiums, and other species which are not particularly ornamental when at rest; and they are thus exempted from the exciting effects of heat and moisture from fall until spring, when growth commences.

Mr. Corning's collection has been for years under the skilful care of William Gray, who as an orchidist is at the head of his profession. The collection embraces the immense total of over 12,000 plants, a large number of them magnificent specimens, in size from a foot to several feet across. There are over 1,100 species and varieties, and among these are 48 species and varieties of Aërides, 19 of Angræcums, 11 of Calanthes, 135 of Cattleyas, 16 of Cœlogynes, 18 of Cymbidiums, 91 of Cypripediums, 102 of Dendrobiums, 31 of Epidendrums, 72 of Lælias, 16 of Lycastes, 34 of Masdevallias, 98 of Odontoglossums, 68 of Oncidiums, 12 of Phaius, 58 of Phalænopsis, 22 of Saccolabiums, 13 of Stanhopeas, 36 of Vandas, and from one to eight or ten species of every other genus worthy of cultivation.

Some idea may be gained of the size of this collection from the numbers in some of the genera, to wit: 6,000 Odontoglossums, 2,000 Cattleyas, 500 Dendrobiums, 400 Calanthes, 300 Cypripediums, 300 Lycastes, etc. The collection contains many unique

kinds not to be found in Europe, especially of Phalænopsis. Of the latter there are such rare kinds as *P. Corningiana*, *P. Brymerianum*, *P. advena*, *P. marmorata*, *P. Valentini*, *P. fasciata*, *P. Reichenbachiana*, *P. media*, *P. Veitchii*, *P. brachyodon*, *P. leuchorrhoda alba*, etc. Among other noted plants are *Aërides Lobbii rubrum*, *A. Williamsii*, *Cattleya Marstersoniæ*, *C. superbissima*, *C. Osmanii*, *C. triopthalma*, *Cypripedium Schrœderæ*, *C. Arthurianum*, *C. candidibulum*, *Dendrobium Corningii*, *D. Wardianum ochroleucum*, *Lælia Veitchii*, *L. callistoglossa*, *L. Schrœderii*, *Odontoglossum elegans*, *O. Wilckeanum flava*, *O. Shuttleworthii*, etc.

The method of growing orchids in this collection has been greatly simplified in recent years. There is no dipping of plants when dry, and it would make one of the ancient orchidists shudder to see the free use made of the hose for all the plants, especially in the hot season, when they are growing. Air is more freely admitted than ever before, and shading is much less used for all the hard leaved plants, like Cattleyas, Lælias, etc.

Some ten years ago or more Frederick L. Ames started a collection at North Easton, Mass. Plants from the Rand collection were purchased soon after, and from that period until now nearly every new variety or species in cultivation has been added from time to time. The Kimball collection, at Rochester, contains a larger number of plants, but that of Mr. Ames is in point of rare varieties the second best collection in America. It is particularly noticeable for the Odontoglossums, Masdevallias, and other cool orchids, while the Cattleyas and Cypripediums are in great force, the latter embracing about every species, variety, and hybrid known. A few years ago a house facing north was built for the cool orchids, and the general judgment is that it contains the best grown lot in the country; the plants number about 1,200, and when they are in bloom offer a spectacle of exceptional beauty. There is a large span-roofed house in two compartments; one devoted to Cattleyas and intermediate classes, and the other to the warmer orchids. A large stove or warm house, originally built for palms and ferns, contains many orchids, and there are two or three other houses in which they are arranged. Another house has just been built, for the accommodation of the large additions which have been made during the past year.

The total number of plants is between 3,000 and 4,000. I am unable to give the exact number or a list of species or varieties,

but among the gems of the collection are such as *Aërides Vandarum*, *A. Rohanianum*, *A. Houlletianum*, *A. expansum*, *Angræcum bilobum*, *A. hyaloides*, *A. cryptodon*, *A. Scottianum*, *A. Chailluanum*, *Calanthe Sedeni*, etc. The Cattleyas are in splendid shape, and among some 200 or more plants of *C. Trianæ* are some of the finest forms known. It is not necessary to enumerate the Cypripediums, as there is hardly a rare kind that is not grown here. Among them is *C. Stonei platytænium*. Among the immense quantities of Dendrobiums are eighteen plants of those most exceptionally rare and beautiful kinds, *D. Ainsworthii* and *D. splendidissimum*, and in fact the most costly varieties of Dendrobiums, Phalænopsids, Odontoglossums, etc., are represented, in many cases by two or three examples. There is not space to enumerate all of the features of this collection, upon which neither money nor skill has been spared. It is and has been for years under the care of William Robinson.

The collection of William S. Kimball, of Rochester, N. Y., is comparatively a new one, but it is now one of the best three in the country, and at the present rate of progress is likely, within a few years, to stand second to none. It was started in 1883, and now numbers 4,211 plants, with 123 genera and 852 species. Among these are 63 varieties of Odontoglossums, 65 varieties of Oncidiums, 24 varieties of Vandas, 52 varieties of Cattleyas, 34 varieties of Aërides, 18 varieties of Angræcums, 48 varieties of Masdevallias, 33 varieties of Lælias, 66 varieties of Cypripediums, 23 varieties of Phalænopsis, 16 varieties of Saccolabiums, 84 varieties of Dendrobiums, and 17 varieties of Lycastes.

Mr. Kimball has perhaps the best Vandas in the country — among them the splendid *Vanda Lowii* from Mrs. Morgan's collection, which is eight feet high. The collection of Angræcums and Saccolabiums is unsurpassed, and there is but one other collection which surpasses it in the variety of Cypripediums. Mr. Kimball is a most enthusiastic orchidist and lets no opportunity pass to secure a rare and good orchid. His houses are models, having every appurtenance and facility for the perfect growth of plants in them. They are under the care of George Savage. In addition to the orchids Mr. Kimball has a lily house which contains a tank 22×65 feet wherein are 24 varieties of Nymphæas and three varieties of Nelumbiums. He expects to flower in this tank next summer the *Victoria regia*.

These already named are the three largest collections in the country; but some of those which are not so large are the results of years of experience and careful selection on the part of their owners. That of Gen. John F. Rathbone, at Albany, is such a one. He has five houses devoted to orchids, and his collection comprises 100 or more Phalænopsids, 500 Cattleyas, 100 Cypripediums, 400 Odontoglossums, etc. His houses are filled with the best varieties of every orchid of value, and the plants are finely grown. Gen. Rathbone has been an orchidist for twenty-two years, and in that period has grown some of the finest plants in the country, and bloomed as many fine specimens as any other grower in this country. Some magnificent Vandas and other varieties which he grew into huge specimens were afterwards bought by Mr. Ames.

Jay Gould's collection (Ferdinand Mangold, gardener), at Irvington, N. Y., is a large one, numbering 2,211 plants and 287 varieties. Mr. Gould is fond of orchids and palms, and his houses are being steadily filled up with new additions, which are well cared for by Mr. Mangold. Among the varieties of this collection are 10 of Aërides, 53 of Cattleyas, 4 of Cymbidiums, 26 of Cypripediums, 38 of Dendrobiums, 9 of Epidendrums, 16 of Lælias, 9 of Lycastes, 18 of Odontoglossums, 24 of Oncidiums, 6 of Saccolabiums, and 6 of Vandas. In order to show how the collection is made up it may be stated that there are, besides those of other kinds, 27 Aërides, 496 Cattleyas, 340 Cypripediums, and 728 Dendrobiums.

De Witt S. Smith, Lee, Mass., is another orchid lover, who has successfully built up a fine collection which will number perhaps from 1,500 to 1,800 plants, distributed nearly as follows: 300 Cattleyas in 31 varieties, 125 Cypripediums in 32 varieties, 200 Dendrobiums in 42 varieties, 80 Lælias in 14 varieties, 150 Phalænopsids in 10 varieties, 23 Saccolabiums in 6 varieties, 40 Aërides in 14 varieties, 400 Odontoglossums in 25 varieties, and 50 Oncidiums in 11 varieties. There are many fine varieties in these houses, such as *Cattleya amethystoglossa*, *C. Triancæ* in many fine forms, *C. Exoniensis*, *Lælia elegans prasiata*, and perhaps the finest plants of *Cypripedium niveum* and *C. Spicerianum* in this country. There is a strong representation of Lælias; and a few years ago Mr. Smith had some of the best plants of Saccolabium in cultivation.

At Staatsburgh, N. Y., is a nicely grown lot of orchids owned by William B. Dinsmore, who devotes four houses to their culture. Three of the houses are each 40×16 feet, and there is a lean-to house for the Mexican plants 14×65 feet. This collection was started about six years ago. The larger part of the Cattleyas and Lælias are specimen plants, averaging from 25 to 30 bulbs each; and there are unusually good specimens of Phalænopsids, one plant of *P. Schilleriana* bearing last year 134 blooms. There are 1,109 plants in all, of which 510 are Cattleyas, 117 Cypripediums, 72 Oncidiums, 63 Lælias, 56 Dendrobiums, 52 Phalænopsids, and 38 Odontoglossums.

Coming nearer home, we find at Mr. H. H. Hunnewell's beautiful place at Wellesley, under the care of F. L. Harris, a very satisfactory collection of orchids, the cultivation of which is most intelligent and instructive. There are 1,250 plants distributed among several houses, one house being devoted to cool orchids. There are 150 Dendrobiums in 31 varieties, 45 Lycastes in 4 varieties, 80 Cypripediums in 22 varieties, 250 Cattleyas in 20 varieties, 60 Aërides and Vandas in 18 varieties, 75 Lælias in 10 varieties, 20 Masdevallias in 8 varieties, 200 Odontoglossums in 30 varieties, 100 Oncidiums in 16 varieties, and 80 Phalænopsids in 6 varieties, including good plants of all the very best kinds, and many fine specimens and noteworthy varieties. The treatment here is of the more modern kind, and robust health is the result.

Another of our home collections is that of Samuel R. Payson, at Belmont, Mass. Here are 1,432 plants, grown by D. Aird. Cattleyas, Dendrobiums, and Odontoglossums are the features of this collection, and they are all well cultivated. There are 75 Phalænopsids, 330 Cattleyas, 180 Dendrobiums, 414 Odontoglossums, 23 Aërides, and 25 Cypripediums, besides a good selection of other well-known kinds. The cool orchids are in a north house, while two span-roofed houses are devoted to others; the Dendrobiums being rested in the graperies and large conservatory. The Cattleyas are particularly well grown, and when in bloom afford a brilliant sight. This collection has been in existence for quite a number of years.

In close proximity to Mr. Payson's we have the well-known collection on the Pratt estate, in Watertown, Mass., under the supervision of David Allan, who has increased the number of plants very largely in late years, so that they now tax the capacity of

the houses in which they are grown. Cattleyas, Dendrobiums, Lælias, and Phalænopsids are the chief features here, and all are admirably cultivated. There is a fine collection of cool orchids forming, which has improved very much in the last two years, now numbering fully 1,000 plants. Among the Cattleyas are numerous fine specimens of *C. Trianæ*, many of exceptional quality; and large masses of *C. Mossiæ*. *Lælia anceps* and *L. autumnalis* are grown in large quantities and in a very vigorous condition. The Dendrobiums number about 800 plants, and those who saw Mr. Allan's specimens of *D. Wardianum* in this hall last spring will understand how well they are grown; and this applies to all the other varieties as well. The entire number of plants in this collection is over 4,000. They are not grown in any one house but are changed about among the numerous houses as may best suit the cultural requirements.

John Wallace, of New York, grows about 1,200 to 1,300 plants at his home in Paterson, N. J.; and, which is remarkable, successfully takes the entire care of them himself, although he goes to business daily. It is an example of what an enthusiast in orchid-growing may do. Mr. Wallace's collection embraces most of the finer kinds in cultivation, and among them many rare hybrid and choice varieties. C. F. Erhart, of Brooklyn, has a well grown selection of 625 plants in 48 species and 268 varieties. He has of Aërides 10 varieties, Cattleyas 29 varieties, Dendrobiums 32 varieties, Cypripediums 22 varieties, etc.

In Vermont, at St. Johnsbury, may be found a strong lot of orchids belonging to Col. Franklin Fairbanks. This comprises 600 plants and was formed seven years ago. It is made up of good specimens of Phalænopsis, Dendrobiums, and other standard genera, and the plants are in fine health. Ex-Governor Fairbanks, in the same place, has a house 60 feet long filled with orchids which are mostly large specimens, and many of the Cattleyas, Dendrobiums, etc. are especially fine plants. This collection also was formed seven years ago.

Another veteran orchid-grower is Capt. Charles H. Snow, who ten or twelve years ago started a small collection near Baltimore; which has since grown to ample proportions, filling a house 70 feet long, there being from 1,000 to 1,500 plants, mostly Cattleyas, Lælias, and Dendrobiums. Capt. Snow is an amateur who gives much personal attention to his plants. The collection of

W. H. Perot, near Baltimore, was once a most promising one, several houses having been filled with plants numbering at least 1,500 to 2,000. It is a matter of regret that it is now nearly dispersed.

Another good collection is that of William Barr, at Orange, N. J. A house 72×22 feet is devoted to it, and contains some 250 plants, which are grown in different sections of the house very successfully. A large part of this collection is made up of Cattleyas, Odontoglossums, Oncidiums, Dendrobiums, and Cypripediums, with a fair proportion of other genera.

The collection of Henry S. Hollingsworth, in Brooklyn, is of good extent, numbering 877 plants and over 300 varieties. Mr. Hollingsworth personally cares for his plants, giving them more air and less heat than is usual, and with beneficial results; a course which all amateurs would do well to follow.

In the Western States, as a rule orchids are not numerous, though many amateurs there are forming the nuclei of collections which, in all probability, ten years hence will closely rival those of the Eastern States.

About the best collection in the West, of which I have any knowledge, is that of W. H. Chadwick, of Chicago, Illinois. This lot of plants is a very good and comprehensive one. It embraces about 522 distinct sorts, though the total number of plants is larger than this figure. There are 64 sorts of Dendrobiums, 36 of Epidendrums, 48 of Cattleyas, 42 of Odontoglossums, 40 of Oncidiums, 14 of Vandas, 26 of Cypripediums, 22 of Lælias, and 16 of Masdevallias, with a large representation of Central American and South American species.

Alexander Mitchell, of Milwaukee, Wisconsin, has a collection; but I have not been able to secure any detailed information concerning it.

Charles E. Hay, of Springfield, Illinois, has a nice small lot of miscellaneous plants grown in two houses, embracing all of the standard kinds. There are three or four other small collections in Illinois and Wisconsin, but none sufficiently large to note.

I have not been able to secure full information in regard to the collections around Philadelphia, where one would naturally expect to receive every aid towards helping on the cause of orchid growing. The collections however in this section are by no means large, as compared with those I have described; and can only take rank with the small lots scattered about in different

sections of the country which, with perhaps an exception or two, are not important enough to warrant description. Mrs. Baldwin has a fairly good collection; and other private growers are F. T. S. Darley, Mrs. R. S. Mason, H. Pratt McKean, Mrs. William Weightman, H. C. Gibson, Clarence H. Clark, and two or three others.

In Baltimore, besides Capt. Snow, the orchid growers are confined to two others, T. Harrison Garrett and Robert Garrett; both of the latter are forming collections, which in time will very likely become of importance.

Mr. T. Harrison Garrett's collection was commenced about four years ago, and the plants are, with a few exceptions, small ones, but the selections have been made with care, and there is a prospect that the collection will become a noticeable one. Three houses are devoted to it, and the total number of plants is 1,347. They are divided into about 600 distinct species and varieties. The East Indian house contains 516 plants, the intermediate house 234, and the cool orchid house 597 plants. Among the notable genera are 242 Cattleyas in 56 species and varieties; 35 Phalænopsids, in 10 species and varieties; 21 Vandas, in 13 species and varieties; 25 Aërides in 13 species; 70 Laelias in 20 species; 198 Dendrobiums in 68 species; 143 Oncidiums in 32 species; 94 Odontoglossums in 36 species. Mr. Garrett is moreover very much interested in our native Orchids, and has collected a large number of species.

An experiment has been made here with a double glass roof for Orchids, and Mr. Grant, the gardener, writes that it has proved highly successful, and not only the orchids like it, but the tenderest fern stands the summer's sun without flinching. The upper glass is about an inch from the lower glazing; and no artificial shading of any kind is used. It is stated that the Cattleyas, Dendrobiums, etc., made bulbs of remarkable strength, which were much shorter jointed, and which flowered with greater freedom. Double glazing has been used before on other houses, but I have the impression that it has not been well received. This practical testimony in its favor is therefore the more noticeable.

At Troy, N. Y., A. R. Smith, a most enthusiastic amateur, grows a small collection to which, like all orchidists who really love their plants, he gives much individual care. The collection of

Mrs. Gardner Brewer, at Newport, R. I., numbers about 400 plants, nearly half of which are large specimens of Vandas, Cypripediums and Angræcums. There is one other small collection in Newport, but it is not large enough to notice.

One of our most promising local collections is that of E. W. Gilmore, at North Easton, Mass., whose plants have often been exhibited here. Mr. Gilmore has constructed a north house, where he has over 500 well grown Odontoglossums and other cool orchids. This collection numbers altogether 1,275 plants; among them 90 Phalænopsids, 100 Cattleyas, 140 Dendrobiums, etc. The plants are cultivated in three houses well adapted to their growth, and there are few if any better collections of the size of this to be found.

Among other small collections, may be noted that of Henry Graves, of New York City, who has a few hundred orchids and is building a house, and another is that of M. Shaw, at Eau Claire, Wisconsin, who grows about 500 orchids in a house 18×60 feet. In addition to the growers I have mentioned there are, as I have said, some others scattered over the country, but their collections are small. I hoped to be able to give some idea of the size of each of these, but my requests for information have not met with the desired responses. I have, however, given data enough to enable those who are interested in the culture of orchids to form some conception of the growth and extent of the orchid fever in this country. This paper is of course superficial in character, but, as matter of record, it has its points of interest for those who give any time or attention to the subject it discusses.

Before closing, it is desirable to refer to the primary rules which ought to govern orchid culture in this country and this latitude. The great obstacles to the successful growth of orchids, as I have found after some years of experience and personal attention to them, are—*First*, The lack of proper and constant atmospheric moisture during the season of active growth. *Second*, The want of a constant supply of fresh air during growth, and still more during the resting period, from November to April. *Third*, The lack of cleanliness. *Fourth*, Over shading the houses during growth, as well as during the resting period. These four points are the cardinal ones in orchid culture, all other requirements, such as potting material, proper receptacles for growth, etc., being of little moment beside these; and want of proper knowledge of them all,

or of some of them, is the cause of all failures, to a greater or less extent.

Our climate is naturally dry and arid compared with that of England, from whence we have had most of the hand-books and rules to govern orchid amateurs. The tendency of these is to lead the inexperienced to believe, after reading up on the subject, that too much atmospheric moisture and air can be given. In this respect, however, modern culture has made great progress. The most successful grower now does not hesitate to leave open both top and bottom ventilators of the orchid house, during the season of growth, whenever the outside temperature ranges above fifty-five degrees, except when there may occur a rapid fall of temperature of the outside air. In consequence, all kinds of orchids may be freely syringed over head even twice a day during growth, and the walks and benches thoroughly saturated. There is little danger of losing the growth of Cattleyas by syringing when the maximum amount of air is given. Slow but solid growth is made in this way, favorably contrasting with the weak, watery growth made in a close, heavily shaded house; and every orchid grower should arrange to give fresh air through the winter, the period of rest. This is the time when orchids, with the exception of a few species from the hottest climates, become debilitated and lose their vigor.

A night temperature of 50° is better than one ranging from 55° to 60°, and Cattleyas and many other intermediate kinds, if in robust growth, will do well in a night temperature of 45°. For the majority of all orchids, tropical or intermediate, in winter, a comparatively low temperature is better than a high temperature maintained at the sacrifice of all the atmospheric moisture, drawn out by over-heated pipes. The latter condition is the cause of so many of our orchids coming out of their winter rest shrivelled and weakened; when, had they been subjected to lower temperature and had more atmospheric moisture and more sunlight, their bulbs would be plump and well ripened and ready to start into strong growth.

Air ought to be given by bottom ventilators in winter if the temperature outside is very low, and on all bright, sunny days the top ventilators should be open. There are many other successful ways of ventilating, but by some method or other fresh air should be had all the year round. Some of the

English orchid houses are especially constructed with flues opening upon the hot water pipes, which distribute constantly a supply of fresh air without creating injurious cold drafts; and such a plan is without question a very excellent one. From the first of December to the middle of February, in this latitude, all shading should be removed from orchid houses, and the full benefit of every ray of sunlight secured. A few species like the Phalænopsids, Bolleas, Pescatoreas, some of the Cypripediums, and some other scattering examples are benefited by slight shading in winter, on very bright days, but the number is less than might be imagined; and even *Phalœnopsis Schilleriana* enjoys the winter sunshine without injury. Full exposure to all the sunlight which may be had in winter is of great benefit to orchids; it ripens the bulbs, solidifies the growth, and stimulates the flowering qualities; and stronger growth and better root action result in the spring. So important is this, that the glass should be clean and free from everything which might serve to obstruct the sun's rays. In many collections you will find the opposite state of things, but a close observation of most of the larger and best grown collections of the country justifies the conclusions I have stated.

From the middle of February, or the first of March, to the first or middle of November, according to the incline of the house, roller shades of the thinnest cheese cloth, running on slats elevated six inches from the glass, are better than whitening the glass, as they serve to keep the houses much cooler than if the sun's rays strike directly upon the glass. For a large number of houses shading of this kind may not be possible, but it is by far the best method yet devised; the great advantages being that on cloudy days the shades can be raised and the benefit of the early morning and late afternoon sunlight can be secured without injury, and above all, in this hot climate, a cooler and more moist condition of the atmosphere can be maintained in the houses.

Orchids which are not kept clean cannot be healthy, and what with white and brown scale, black and yellow thrip, and green fly, the cultivator needs to be alert. I believe in mild fumigation once a week, as the only proper method for keeping a house clear of thrip and green fly, though many growers have an impression that orchids do not like tobacco smoke. I have never known one, even of the thin-leafed kind, to be injured by a light fumigation properly given; and two of these in succession, or one given every

week, will certainly keep a house clean from these pests. I may add that tobacco stems placed under the benches and kept moist are invaluable preventives of thrip and green fly; and they must be replenished when the strength departs. Most tender ferns will, however, be injured by this process; nevertheless, I can strongly recommend it for orchids. Plenty of fresh air is one of the best preventives of all kinds of thrip, green fly, and red spider. If growers start with clean plants, they can save themselves great trouble by the "ounce of prevention" in the way of mild fumigation. It is easier to keep out insect pests than to get them out when once established. White scale does more injury than is credited to it. Nothing but careful sponging and brushing with soapsuds or insecticide will eradicate it. It is an insidious pest, and ruins the plant before an inexperienced person will detect it. Every orchid ought to be sponged over with clean water two or three times a year; but this is a rule not as generally regarded as it should be, for in many collections dust and dirt are allowed to accumulate upon the leaves, to the great detriment of the plants.

There are many other points in orchid growing which could be taken up and discussed in this paper, but a grower will find them of minor consideration in comparison with those I have mentioned. Personal knowledge of details is of the greatest value, but the beginner as well as the old hand at orchid culture must keep in sight the four prime requisites of success which I have stated, if they expect to maintain their orchids in robust health for any period of years.

Discussion.

Rev. A. B. Muzzey was ready to say that eminent patience is genius, — he knew no better definition of that word. Think of it, that in the culture of orchids a man has devoted nineteen years to a single experiment! Now let us carry that same spirit into the work of this Society, and we shall have something of the glorious beauty in this specimen* before us, as the result. He bade the Society God speed in all its attempts to promote horticulture; and moved a vote of thanks to the essayist for his patient, thorough,

* A fine, large plant, abundantly bloomed, of *Dendrobium Wardianum*, from A. W. Spencer.

and admirable essay — which, as a record of what has been done, would find no superior.

The vote was passed unanimously.

President Walcott said that the paper was one well deserving a full discussion, and called on William Robinson, gardener to F. L. Ames.

Mr. Robinson said there was one point he should like to refer to, in regard to collections of Cypripediums. He thought that Mr. Ames has as large a collection of this genus as any grower in the United States, and as large as any private individual has grown anywhere. He had given to Mr. Beard, as the number in Mr. Ames's collection, about seventy-one species; but did not include varieties or American species, so probably Mr. Corning's and Mr. Ames's might have come pretty nearly together as to numbers, if he had counted the varieties and American species in the latter collection.

Speaking of what Mr. Beard had said about keeping the temperature down to fifty-five degrees at night, he thought it a little difficult, particularly in view of such weather as last week's, to keep the house at that temperature during the night and raise it again in the day time so many degrees. Such a temperature may be had and such changes made, provided you have your house so constructed that you can run it without absorbing the moisture by such rises in temperature. Conditionally, he would grant that you can keep the house at fifty-five degrees, and then run it up in the day time; but he thought few orchid houses are so constructed that this can be done.

He thought that the greatest preventive of green flies is putting tobacco stems on the floor and on the pipes. No one trying this will be troubled much with green flies afterwards.

Mr. Beard said his own experience had been that tobacco used as recommended by Mr. Robinson is no less effective than in the form of smoke. Ferns are liable to be injured by the tobacco in either form, but when fumigation is employed they can be taken out, and returned to place after the process is concluded. He remembered that Mrs. Morgan's collection, some years ago, was overrun with the yellow thrip, which is much worse among orchids than any other insect, with the exception of cockroaches; but she put in several barrels of tobacco stems, which were constantly dampened and replenished, and the result was that in a short time

the thrip was pretty well eradicated; so that he could bear testimony to support Mr. Robinson's recommendation of tobacco stems for extirpating all insects that can be killed by fumigation.

His own experience in regard to running up the heat of orchid houses is that, if the weather is so cold that the temperature cannot be run up without great fire heat, it is better to let the day heat remain at fifty-five degrees, rather than attempt to raise it ten degrees. Saturation of the air with moisture is essential in orchid culture. Their native homes are in regions where moisture is constantly around them, and the combined sunlight and fire heat of artificial culture are injurious to them, if they have no atmospheric moisture to counteract it. It is better to allow the temperature to remain low rather than attempt to run it up.

Hon. Marshall P. Wilder could not allow the subject to be closed without saying that this paper is one of the most able and elaborate, on the growth of orchids, that he had ever heard. It is also a very valuable addition to floricultural history; and it will be so esteemed in the Old World, from whence we receive so many of our fine orchids. He did not doubt that we should see it copied in the leading horticultural journals in Europe. Mr. Beard had stated that the speaker presented the first orchid exhibited in this Society. This was very nearly fifty years ago, but he well remembered the plant; it was *Oncidium flexuosum*. It covered a large space on the wall of his greenhouse; and, if he recollected rightly, had a hundred and seventy-six individual flowers. He was surprised to see that so few of the collectors to whom Mr. Beard had referred had a large number of Oncidiums. He believed that Mr. Beard had reported Mr. Hunnewell to have about a hundred species and varieties; if so, that is probably the largest collection of Oncidiums in the country.

This paper shows how immensely a subject may grow in the course of half a century. Beginning with that little plant of Oncidium which had been spoken of, these immense collections have grown up since that time in our country. He might say that the orchids are the most gorgeous plants in creation; and he felt extremely obliged to our generous contributors, who do so much to increase the interest in that order by their exhibitions here, — to Mr. Ames, Mr. Hunnewell, Mr. Payson, Mr. Pratt, and others, who spare no expense whenever they can add anything beautiful and valuable to their collections. Mr. Ames told the speaker that

he had a single plant for which he paid almost a thousand dollars.

Mr. Robinson said that the plant mentioned is a *Vanda Sanderiana*.

Mr. Wilder added that we have reason to be thankful for what has been accomplished, and to hope that this order of plants will receive more and more attention, as he had no doubt it would. It is easy of cultivation, and many of the most beautiful species are cool orchids that can be grown with great ease.

James Cartwright was called on and said that most of his orchids are Cypripediums. He has one hundred and twenty plants, which he grows in very cool houses, the temperature having been down to forty degrees a good many times this winter.

Notice was given that, on the next Saturday, Dr. G. Austin Bowen would read a paper on "Homestead Landscapes."

BUSINESS MEETING.

SATURDAY, March 13, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

On motion of William C. Strong, seconded by Rev. A. B. Muzzey, the following preamble and resolution were unanimously passed: —

Whereas, The Massachusetts Society for the Prevention of Cruelty to Animals has petitioned the Legislature of Massachusetts to enact a law making it the duty of all teachers of public schools in this Commonwealth *to instruct their pupils, in such manner as the School Committees of the several cities and towns shall determine*, in regard to the importance of protecting our insect-eating birds and their nests, and to treat the lower animals kindly; and *whereas*, we believe it to be for the benefit of this Commonwealth that such instruction be given in the schools:

Resolved, That we do most earnestly ask the Legislature of Massachusetts to grant the petition of said Massachusetts Society for the Prevention of Cruelty to Animals.

The preamble and resolution were signed by the President and Secretary of the Society, to be presented to the Legislature of the State as a petition.

Adjourned to Saturday, March 20.

MEETING FOR DISCUSSION.

Homestead Landscapes.

By George Austin Bowen, M.D., Woodstock, Conn.

There is no word in the English language of deeper significance than that good old Saxon one "home." It in some way expresses more of human heart and feeling, and of the conditions and sentiments that characterize a true manhood and womanhood, than any other word in our extensive vocabulary. Its utterance at once brings to mind scenes of domestic happiness. Home is the one centre around which revolve all the feelings and aspirations that stimulate our daily exertions; and it is the only place that affords the tranquillizing influences so necessary for refreshment after the rude contacts and the busy turmoil of our outside life. Love and joy—happiness and peace—are expressed in its very name. The thoughts of wanderers on sea and land revert to it with deep and persistent emotion; and the heart of man everywhere derives from it a contentment that can never be supplied from any other source —for it is the only place in all this world where hearts are sure of each other.

The influences of home create and develop not only the character of individual men, but of mighty nations. Refined sentiments, lofty aspirations, and purity of moral character are developed far more by the unseen influences of home teachings, and home surroundings, than by all other causes combined. The home life of any nation is the truest index of that nation's civilization. Looked at the world over, the comparison of homes with character justifies this broad conclusion. Stating it in one aspect, I suppose we should say—"As a man is, so *he makes* the home." But does not that home, once made, tend to keep him true to the impulses that inspired him in establishing it? And does it not exert a yet more wonderful influence upon his children, whose characters are still in the plastic stage of formation? Therefore the expending of time, thought, and study upon the problem of improving the

homes of all classes is not only permissible, but presents itself as a duty owed to the individual, to the family, and to the community. And surely no section of our broad land offers better opportunities and facilities for refining and elevating homes than our own loved New England.

The rude homesteads of New England, peopled by a sturdy race, have exerted, and are this day exerting a perceptible influence upon our national prosperity and character, but under the inevitable law of change, and the universal tendency to variations, they have gradually been modified in style and character. The humble cabin, built of logs and picturesque in its simplicity, in time gave place to the more commodious though still humble cottage, which in its turn succumbed to the square two story structure with its ell; a type so dominant in the architecture of the Eastern States, in times comparatively recent, that it may be said to be characteristic of those times. Fashion ruled in our fathers' days as well as in our own; but she is a fickle goddess, changing every day, inconstant as the wind, and the shapes she but lately considered as ideally perfect in regard to style and convenience are today looked upon as antiquated and uncomfortable. The surrounding lands changed their aspect with the dwelling, as the actor changes his dress to correspond with the character. Fields freshly hewn out from the forest, stump-decorated, harmonized well with the log-built cabin. The cottage, built later in the subdued clearing, and surrounded by well walled fields, told of the prolonged toil that had been bestowed upon the land, fitting it for tillage by the simple implements of those early days; and showed the prosperity of its inmates. The subsequent square farm house, with long-sloped rear roof and extensive ell, and several small buildings around, was likewise in keeping with the time of its construction, and the enlarged labors and productions of the farm. Thus the dwellings and the land have ever been characteristic indications of each other's prosperity, and are so today. But at the present time we observe contrasts more marked than at former periods, chiefly due to the concentration of population in towns and villages, which has succeeded the more scattered distribution of an earlier day; also to the consequent change in the choice of crops for cultivation; to the increased wealth and prosperity of the people; and to the exodus of city dwellers to the country during the summer months.

All new countries have presented the same succession of changes, in the various phases of progress from pioneer life to that characterizing old established settlements; and when that point has been reached, certain other conditions have uniformly succeeded. It requires no prophet to tell what the future of New England will be. The history of all older Anglo-Saxon civilization will probably indicate the course of our own.

I have never for one moment entertained the idea that the New England States have seen their best days, and in time will be left out in the cold—desolate and unlovely. I believe that they will always hold the lead in the future, as in the past; that from their geographical position wealth must naturally come to them, and that in time—and not a very long one either, as we view national growth—we shall present as attractive scenes of cultivated landscapes, and imposing homes, as do the most civilized countries of the old world. And certainly no region can offer better opportunities than our own, with its wooded hills, open valleys, and picturesque lakes and streams. We have but to give a little thought to the subject, and then let our work follow in fulfilment of it.

Do you ask when the era of beauty is to begin? I answer that it has already commenced, and I can point to many sections that show the fruits of this thoughtful purpose. It is to be attained gradually and by accumulation of individual efforts; not by a great uprising. Each minute coral insect builds only its own diminutive dwelling, but the resulting aggregations make the beautiful archipelago. I would not have you tear down and radically reconstruct your homes in more elaborate designs; but let each one simply ask—Wherein can my own homestead be made to harmonize with this coming change? Where can I correct its deficiencies, and where enhance its merits, making it more attractive to the eye, more comfortable for occupation, and—for this is practical New England—at the same time increase its revenue.

If asked to furnish a description of an ideal country home, you would scarcely describe the present average country residence, and hold it up as a model for others to copy. And yet, taking any one of these homes, and looking at its outlines and surroundings, any person who possesses even a slight knowledge of architecture and landscape gardening might at once point out many features that could be changed entirely, or modified, or enlarged; which being

done, with the supply of a few additional embellishments, such as trees, rocks, or other out-door objects, and a porch, piazza, bay or landscape window added to the house, would completely transform the appearance of the place. And those most intimately acquainted with it would be driven to doubt whether that particular part of the brain, which phrenologists denominate "locality," was not at fault and deceiving them.

It is thus that I would have you look at your homes with me today. Some of them, I know, are examples of the most skilful construction, and have been embellished by lavish expenditure, and are finished country homes. All that I would say to the possessors of such is—Enjoy them to the utmost, and be thankful that you have them. But many others, I know, stand in need of a little criticism, and, as we proceed to develop our subject, we may be able to bring forward suggestions that will be of general benefit.

The first suggestion that I would offer is this—that expenditure of money does not always bring a return in true beauty. I have in mind one lawn that remains dull, flat, and uninteresting, although it has absorbed money enough to have made earthly paradises of all the estates in the village, had it been expended with good judgment.

A first general rule is that every building should, as far as possible, conform to the character of its site and of the surroundings. Place a castle on the hill, and a cot in the valley—never the reverse. The most incongruous piece of architecture that I have ever seen was a Swiss chalet in a closely built city street. Such an instance affords an example to be avoided.

Another imperative rule is to preserve the salient features of a landscape. A lawn preserving the natural slopes of the ground, with easy circuitous pathways, is far more pleasing than a dead level, with all the lines at right angles. A rocky border, a precipitous gorge, or a tangled thicket is oftentimes better treated by embellishment than by removal. Even boulders, expensive objects to remove, become useful features when made centres or backgrounds for appropriate shrubbery.

There is an old saying, which is full of truth, that will apply to him who commences to improve his home and surroundings; it is —"Plan the patch before the cloth is cut." To begin wisely, a plan should first be outlined; and can afterwards be gradually

worked out in detail. There are two ways of doing this. One way is to employ a high-toned architect to reconstruct the house, and a landscape gardener and a brace of surveyors for the lawns and fields. It sounds well to talk about them, and they are very interesting objects to look at while they are at work, but will not be likely to exhibit as much agility and animation as you yourself will when they have finished, and present their specifications and bills.

In country localities congenial society is oftentimes scarce; therefore the country resident is forced to seek his pleasures and recreations in and about his own homestead, and therein lies a mine of crude satisfaction, to him who has the ingenuity to work it into a tangible shape. I would, therefore, advise a second way, one which has the double advantage of annihilating the expense, and increasing the satisfaction. It is to draw the plan yourself. Perhaps you say you cannot. I say you can if you will.

Having thus arbitrarily settled that point, we will now commence work. Take some bright morning when your digestion is good, and you feel at peace with your neighbor who borrows and never returns, and when the note you gave to settle your fertilizer bill is not quite due; then enter upon the task with a determination to have a feasible plan before evening.

Take the house first. Scan it with an eye critical of its defects, and study to find a remedy for each. Should you be so fortunate as to have an old-time house, with ample chimney, shallow eaves, and quaint little windows, content yourself with its simplicity. Seek to make only such additions as will be suggestive of "solid comfort" and will be in keeping with the quiet air that invests all such venerable dwellings. Do not try to modernize it, for it cannot be done; architect and builder will only impair or destroy the charm that time has placed as a spell around it.

But these old structures may receive improving touches. A wide spreading porch over the door, having bracket supports instead of posts or pillars, will add to rather than diminish its quaint and homelike charm. Do not make the porch heavy and solid, with straight timbers, but shape the edges and bevel the ends till they have an artistic effect, however rough in workmanship. A broad, low piazza, with light supports, might be permissible, should a re-entrant angle be presented by a projecting portion of the building. Consider all such proposed additions

with the mind's eye; trace them on paper, to be filed with the ground plans, as notes of ideas for future development.

Do not forget to include, in your scheme of improvement, removal of the lilac and sweetbrier bushes from before the windows. Let these and similar shrubs be placed at a respectful distance from the house, and let vines be planted in their place; which, in a few years' time, will cover the unpretending structure with a mantle of living green, and will thereby add greatly to its healthfulness as well as beauty.

Should the house be of more recent construction, a bay window may be thought of in the place of the flat one, which now gives light to the living room; or a landscape window, should that room be one of ample proportions. Consider the planting of vines here also, for they are becoming to all classes of dwellings, from the humblest cottage to the most elegant mansion. No feature in the landscape gives so much interest as well placed vines; the wonder is that they are so little used.

Perhaps when you look at your own dwelling, neither of these distinctive types meets your vision, but you behold a modern American dwelling, with its shams and false pretences, painted with as much gorgeousness as a Chinese lantern, replete with all the so-called modern conveniences of furnaces, hot and cold water, shoddy plumbing and sewer gas. If so, go no further in your plans for landscape ornament, but devote yourself in earnest to the sanitary problem. Too many such houses generate and harbor the germs of scarlet fever, diphtheria, and kindred diseases. It will not be prudent for you to proceed in other improvements until fully assured on this point; for the modern American house—the blending of the styles of Queen Anne and Robinson Crusoe, Gothic church and Virginia cabin—Ionic, cubic, and diabolic, is more often a death trap than a protecting home.

A house must be viewed from many different standpoints—as a connoisseur of pictures views a work of art from all directions. Especial regard should be had to its site and immediate surroundings; for a house requires a suitable frame or setting as much as a picture. This is especially true of a dwelling placed upon a hill; where, without some effective surroundings, it is likely to look bare and cheerless. This appearance, however, can be relieved by planting trees in such positions as, in time, to shut it in somewhat, yet not so close as to overshadow it. It needs a background of

tall trees, which will break up the regularity of the sky line formed by the straight roof. The outbuildings should be kept from an undue prominence by groups or bands of evergreens.

As the plan slowly unfolds before us and as we depart from the house, a lawn inevitably presents itself to the mind, for there is no one feature that gives a greater air of elegance and comfort to a place than a well grassed lawn. It may often be an expensive toy that scarcely repays the labor bestowed upon it; but it also may be an object of great beauty, and one which, without any considerable expense of money or toil, seems always in order. I do not propose now to enter into the details of the construction of a lawn, for they must vary with the conditions of every place. Any one, who inclines to study and improve his opportunities in this direction, may find all needed assistance in earlier publications of this Society.

The forming of a lawn will at once sweep away one of the greatest blemishes of our country homes—the little door-yard fences, running to every corner of the house and enclosing spaces too small for any practical use, harboring noxious weeds, and encouraging the presence of tangled and decaying grass, thus rendering the ground damp and unwholesome. They are inconvenient, unattractive, expensive, and unnecessary. Make a marginal note on your plan for their immediate removal.

Next proceed to stake out a driveway leading from the highway to the house, including a circular or oval turn convenient to the front door, and continuing to the stable; this should be at least twelve feet wide, and should follow the easiest and most accessible route. Pathways should also be staked out, leading from the house to the highway, the well, the various outbuildings, and places most frequented. One simple rule will dictate the route of all paths and driveways, and insure a graceful outline. It is merely to follow the trail one would naturally make in going from one point to another. Instinctively the feet will seek the easiest direction, avoiding rocks, shrubs, and undulations. Did you ever follow a cowpath through a rough pasture? No one will give cattle credit for engineering science, yet the path they make will always be found the easiest and most direct route from point to point, which is just the object we aim at.

When your paths have been thus staked out, trace them on your plan; the intervening spaces will form the lawn. Let me advise

in this—do not plan to grade it too much; aim simply to smooth the surface, retaining all prominent or curious rocks and native shrubbery.

It is an almost universal fact that lawns in our Eastern States are too small. In other sections they seem to understand this point better, and do not hesitate to devote several acres to this use, and certainly no one item can contribute more of an air of elegance to even a humble place, than an extensive opening around the dwelling. To get this, it is oftentimes necessary to throw the fields adjacent to the house into one large enclosure.

The general outlines of a plan are perhaps all that one can secure in the first draft. A few groups of shrubbery can be indicated, in what might be called naturally fit positions, such as at the divergence of paths, at the ends or sides of rocks, at the base of cliffs, or as screens to outbuildings, etc.; but the details must be left to future development.

We find many instances of partially well planned homes throughout the country, the house and the immediate grounds affording pleasing examples of what refined taste, aided by wealth, can create, but the care of the occupant having gone no further, unless in building miles of useless stone walls. But I would have the results of an artistic directing mind apparent over the whole farm, no less than in the dwelling and immediately about the door. The same careful planning should be given to every acre of the land, not perhaps with a view to equally elaborate embellishment, but to get it out of the rough state into one more refined—as park-like and artistic as possible.

Have the kindness at this point not to judge me too hastily and accuse me of fostering ideas of fancy farming, but bear with me awhile, and I will endeavor to show that it is practical farming that I advocate, adapted to practical New England, where every day must be made to count as a bread-and-butter day. A leisurely saunter over the farm will suggest a multitude of changes, which would enhance the working advantages of the place and the pecuniary interest of the owner.

A bit of old wall, with stumps of broken bar-posts rising from moss-filled turf, and a growth of red osier standing gallantly over all—these make a subject for a very pretty picture to display on one's library wall; but the actual presence on the farm of a long line of such fencing will hardly be attractive. It gener-

ally fails to turn stock, and always becomes a harbor for brush, and that little nuisance the woodchuck. The thoughtful farmer's judgment does not hesitate long regarding walls. He knows that they are expensive to maintain, that large fields are easier to cultivate than small ones, and that it is about as expensive to relay a tumbling wall as to remove it altogether; hence all unnecessary walls shall be doomed, and the material shall be used to reinforce those that are actually necessary—and a good wall is in some situations a necessity; but it is never picturesque, as is an old one, and this is so simply because it is fast reverting to wild and natural conditions. No artist would select as a subject for a picture a good substantial stone wall, such as covers the farm requirements of "horse high, bull strong, and pig tight." He could not make it attractive—neither can the farmer, who understands less of art; therefore the fewer he embellishes his land with the better.

The inquisitive eye will also be quick to perceive the possibilities of an old "alder run;" even though the land be unsuited to cultivation, it can be put to more profitable use than harboring the undesirable wild growths which infests it now. A strong-armed man would soon finish the job of cutting them, and with no great stretch of the imagination one may picture in their place a grove of maples and elms, with a few outstanding willows; and possibly a fish pond, to be created by an inexpensive dam. I have heard of one use and but one for alders on a farm—it was that "the cattle loved to brush through them to remove the flies." The farmer who gave me this valuable piece of information owned two brindle cows and a roach-backed calf, and had alders enough to do the brushing for a drove of western steers.

The natural landscape of our New England farms is diversified. I feel positive that you will not question this point. It is like our weather, showing a maximum variety in a minimum of space; smooth fertile fields, sandy dunes, rolling hills, and abrupt crags are commingled in a way to bewilder all but geologists. A prairie farmer has no diversified problems of utilization to solve; his farm is equally fertile in all parts, and is as square and monotonous as a checker-board, but his eastern brother can pick out a bit of strong land only here and there, and it is a question what he is to do with the larger remaining portion to make it remunerative. He is forced to pay taxes upon it, though deriving no income.

These comparatively or wholly barren spots are found more or less upon all our farms. They cannot be given away, for unfortunately they are scattered about like bad men in a community; not in one section where they can be set aside by a dividing line.

A plan for farm improvement must necessarily embrace many of these unattractive spots; but if you will give them proper thought and care they can be made to produce five per cent and possibly seven per cent annual profit on their taxed valuation, at the same time presenting to the eye an attractive picture both in summer and winter. If thoughtful care will do this—and hundreds of men are ready to testify that it will—there should be no hesitation in adding, on our plan, a marginal note to plant these unprofitable places with suitable trees — larch, pine, hemlock, chestnut, or whatever variety seems best suited to the spot.

Developing our plan still further, let it embrace good solid farm roads, to be so laid out as to render the greatest number of fields accessible. This will naturally include the filling in of low wet spots, and the grading of steep ascents. Should a running stream be crossed by this internal highway, design a strong substantial bridge with a rustic railing (which is cheaper and handsomer than one of finished timbers), and do not be content with a ford.

Plan to clear away bushes from roadsides and to replace them with trees; plan for trees in pastures, on steep hill-sides, and in all the more inaccessible corners. Include here and there a close planted evergreen hedge or windbreak for exposed situations; in short go over the farm till you are familiar with every rod you own, and have some well matured plan for its improvement.

A pretty plan on paper, with neat marginal notes, as described, would be looked upon by many as a "castle in Spain," or in that yet more indefinite locality—the air. And this, in truth, is what the *plan* itself is. But I believe in air castles; I regard them as most excellent property; I believe that all good business men build them; yet they do not rest there, but strive to bring them down to a terrestrial foundation.

We do not use adages and proverbs as much as our ancestors did, but a few still linger in daily use, among them one that upholds me in my proposition; it is this: "Well begun is half done." A well considered plan means not only systematic work, but economical work. The great advantage of such a plan is that not one stroke of work will be lost; each part can be worked to

the advantage of another; thus, are a few loads of earth required in grading? The bed of the future roadway will supply it, and the excavation made will serve as a convenient dumping ground for stones removed from the fields.

But how is our plan to be executed? Shall it be as public parks are created, by employing a host of laborers, gardeners, and surveyors, the labor of teams and the blasting of rocks, creating chaos and finally bringing out a crude landscape, that requires time for ripening, so to speak, by arboreal growth? Well, it can be done in that way, but my word for it you would not enjoy it much, if you are a true lover of nature and a patient worker. I have seen men improve their places in that manner, but it generally absorbed their bank balances, their credit with their friends, and their wives' dowries.

The true method is to work it out by one's self, as we have supposed the planning done; and to a methodical man there is no pleasanter occupation to be found than in thus carrying gradually forward long cherished designs. It is surprising how fast a place will grow in beauty under a directing mind, without much visible effort being made in that direction, mainly by bits of chance work, as it might be termed.

For example, in making excavations, or in removing stone walls, a large boulder may present itself. The question at once arises what is to be done with it. The plan will show that it is needed at the divergence of a pathway, where it becomes an object of natural fitness; or it may be dragged to the side of a lawn, to become in due time an accessory in a prospective group of shrubbery, or it may be thrown into a ravine to aid in the formation of a cascade.

Again, there is no more attractive feature about a country place than a shaded pathway climbing a rude steep; but it would be expensive work to drag stone expressly for the needed steps, and much time might be consumed in seeking out and collecting a sufficient number of proper shape and proportion; whereas they are frequently presenting themselves one by one as other labors are carried on, and can be easily deposited where they will soon become of service; and so in many similar ways a feature, objectionable in its original situation, may, at a slight expense of time, be made a leading advantage in another.

The prominent attraction of all country scenery around residences

or farms is in the trees, and the shade afforded by them. I care not how costly a dwelling may be erected, or how lavish the expenditure upon roads and pathways, and in adorning the grounds with fountains and statuary; the place if destitute of trees will look cold and dreary in winter, with the bleak winds coursing over it, and be heated in summer like a Sahara under the untempered glare of the sun. Such places can never be homes of comfort, but will be abodes of malcontent.

Contrast the greater charm of the more humble dwelling surrounded by trees, which screen it from the force of both wind and sun; offering in the warm season a cool retreat beneath their spreading boughs, and imparting freshness and vitality to the air by moist and fragrant exhalations from their leaves; beautiful in summer, not only by their shade, but also by their variety of form and foliage; and in autumn by the rare coloring they spread over the landscape, excelling the work of any artist's brush; and later imparting to the air the soft warmth of their decaying leaves; and even in winter showing variety of form and modest coloring assumed by branch and twig. Surely no one would think of living in the country without surrounding his dwelling with trees; not only the land adjacent to the house, but the whole farm should be made to receive from them the benefit they bestow. Therefore, the man who plans wisely for external home adornment will devote much time and thought to the study of arboriculture, and his grounds will show his proficiency therein by the skill displayed in so grouping his trees as best to bring out their characteristics.

I am sorry to say that the ordinary country dweller seems to have an aversion to trees, and where one is found who has some fondness for them, he often shows a fearful ignorance of their actual value. I cannot conceive how the descendants of tree-cultivating Europeans can have acquired the tree-destroying habits of the present generation, unless it be because their fathers, having to hew their farms out of the wilderness, thought only of clearing them of *all* trees, and thus their offspring derived from them *a tree killing instinct*, just as we see children of dissolute parents inheriting their instincts to crime.

Whatever the cause may be, the average Yankee seems to have a natural aversion to all indigenous growth, and as soon as a tree shows a stem that can be split for cordwood, he is uneasy till he has prostrated it with his axe; and he never feels in fit mood to

sing the psalms of praise and thanksgiving in his church service till he has cleared from the highway every tree large enough to give shelter or pleasure to the weary traveler. We are slowly beginning to realize that there is a wholesale destruction going on, which needs to be stopped. I trust that I may live to see the time when a man who cuts down a tree of any description, without legal authority, will be punished as a criminal.

A few suggestions may be in place here regarding the location of trees, shrubs, and vines. The latter should be used to cover exposed ledges, rustic trellises, railings of bridges, arbors, and especially the dwelling. In the case of non-supporting climbers, or plants which are partially so, like the woodbine, I have found one of the best aids in ordinary wire staples, such as are used to secure wire netting,— a size smaller than those used for wire fencing. These should not be set enclosing the vine, for in future years they would interfere with its growth; but should be driven in beside it, the vine being fastened to them by hempen twine. There is a general opinion that vines render a house damp, but such is not the case; the multitude of rootlets they throw out absorb much moisture, and no house is so dry as the vine clad one. A beautiful effect is sometimes produced by planting vines at the base of trees, and allowing them to ascend to the branches, and there run riot, and hang in wild festoons. The woodbine and trumpet creeper are both very effective when growing in this way.

Shrubs should never be placed very near a house; especially avoid planting them under the windows, which is a common custom. Let the grass grow to the very foundation walls. A natural situation for them seems to be about rocks, at the base of cliffs, or at angles and turns in paths and roadways. They are effective ornaments when grouped in lawns, or as screens for outbuildings, bleaching grounds, etc.

Trees should never stand close to the house, but should be at a distance just sufficient to prevent their overhanging the roof; and should be of a kind that will grow higher than the topmost ridge, thus securing a pleasing sky line as before advised. Keeping the trees at the proper distance will allow the house to stand out in distinct view, showing its individuality; and will permit the sun's rays to strike almost every part of it, at some period of the day.

Trees on a lawn should never be planted so thickly as to prevent them from assuming their proper individual characters and

distinguishing forms. If evergreens are planted, they should not be trimmed up from the ground, but allowed to branch throughout their entire length of stem. The same may be said of weeping trees, and of most of the birches.

In planting trees for landscape effect on actual farming ground, a good deal of thought is necessary in order to avoid encroaching upon tillable lands, and to occupy such only as are unfitted for profitable cultivation; and also to so place the trees as not to produce the formal effect of lines or blocks. If, however, there is no outlying spot which can be thus occupied, and made to break up an undesirable regularity, a similar effect can be secured by making a careful selection of varieties, and so interspersing them as to give an irregular sky line with a broken border line and contrasted colors.

Formality is always to be avoided, and yet there will be much that must be regular. For instance, many wind-breaks must of necessity be so placed as to give a straight outline. Here and there, however, according to the nature and value of the land, the trees can be placed in irregular groups, composed of a number of varieties, thus affording a pleasing park-like effect.

In developing a homestead landscape, there is one thought that should always be kept in mind. We must remember that we are not merely creating a park, but are looking for profit as well as pleasure. We are aiming to conduct our farming according to business principles, and, while gratifying a taste for beauty, we have a need for dollars and must plant accordingly. Therefore our varieties cannot always be the most ornamental, but must consist largely of those most in demand for timber. Our plan contemplates that in due time the thinning out, and the occasional clearing off of well grown spots, will afford a cash income, besides providing fuel for household needs.

To go gradually and completely over an ordinary farm, in the manner described, utilizing its waste places and bringing beauty as well as profit out of deformity, will require not only much time and labor, but also a large amount of nursery stock. On the first mental calculation of the capital necessary, it might seem, to a poor man, to amount in itself to a prohibition. So it would if all the money had to be expended at once, and all the trees had to be purchased of the nurseryman, but as the plan is to be advanced gradually, and to be carried out mainly by one's self, there will be

ample opportunity to procure the stock cheaply as the work goes on. To give a clearer idea of the suggestion here intended, allow me to relate some bits of personal experience.

Four years ago one of my townsmen, pointing to a row of shapely elms in front of his house, said that when working one day in a neighbor's garden he took them up as seedlings, brought them home with him at evening, and planted them in his own garden; from whence in a few years they were removed to their present location, where they have become trees of pronounced beauty.

Shortly after this conversation occurred, being engaged in working a roadway on my own place after the plan described in this paper, I discovered a number of seedling elms, twenty-five of which I transplanted to a locality suitable for their further growth. Soon after this, I discovered by the roadside a number of seedling balsam firs; eighty-five of these were soon screened from the sun under the seat of my buggy, and before nightfall were placed in company with the elms. In other drives, seedling hemlocks, chestnuts, arbor vitæs, tulip trees, beeches, maples, white and yellow pines, etc., presented themselves, and were added to the collection, making quite a complete nursery. In the fall, hickory nuts, chestnuts, and horse chestnuts were planted, and the seedlings gave me much delight by their peculiarities of growth the following season.

These have been transplanted in such a manner that I expect in time to place them in permanent positions, and have them succeed, — even the difficult hickory. You see that from this suggestion, caught from my neighbor, has grown a fine home nursery; from this in the spring I shall transplant at least twenty-five well grown trees, which being removed at the right time, and without the roots becoming at all dry, will be much more sure to grow than those which I might obtain in the market. These trees have not cost me one dime in cash. Every item of labor connected with them has been done by myself personally — which was also to my physical benefit.

Another source of supply for a farm nursery is the nurseryman who grows from seed; who will sell seedling ornamental or timber trees, at from one-quarter of a cent to two cents each, according to the variety. Five dollars so invested will give a fine start to a farm nursery, and in a short space of time will create a

decided improvement upon the place. Larger trees from two to seven feet high and cut back to the ground are sold at slightly advanced rates. These may be planted in the nursery, or in permanent locations. They will throw out strong new shoots, and soon surprise us by their tree-like form.

I cannot close this paper without making some allusion to our native shrubs, many of them rivalling those imported from more favored climes. A lawn decorated with such shrubs can be made exceedingly attractive, and with only the cost of transplanting. Such are the common barberry, may apple, clethra, elderberry, thorn apple, the beautiful laurels, and the brilliant black alder, the various viburnums and cornels, and the clematis, bitter-sweet, and woodbine, so attractive for covering stone walls and fences as well as our houses. Surely, with such resources at hand, no one can make any excuse for living in a barren unattractive home. I have transplanted many fine specimens from the roadsides; discovering them when in full flower, stopping then not only long enough to admire them, but to mark them, by fastening a few inches of surgical bandaging material to branch or stem, and making a note in my memorandum book, which enabled me to identify the locality in the fall, after the leaves had fallen, and when they could be more safely removed.

Land in New England is cheap—lower than in many parts of the West; but it will not always remain so. The West will fill up and a check will be placed upon emigration. A reaction will follow in this as in everything else. These older states will hereafter sustain more than double the populations that they now do. There will come a rise in land values, which in turn will impel us to more thorough tillage; and with the general advance in taste and culture, which in our democratic country can never be confined to one class, a corresponding impression will be stamped upon even these rocky hills, making them artistically beautiful as well as abundantly productive. These transformations will do much to change the wandering instinct, now so prominent a characteristic of our people, into that better trait called inhabitiveness or love of home, which is the direct outcome of civilization, and the best index of its advancement.

DISCUSSION.

William C. Strong said that all would agree that the paper which had been read contained many valuable suggestions. He was pleased with its tone, and with the idea that every man might become his own landscape gardener. Planting trees so as to bring out their individual characteristics is very desirable when it is possible, but sometimes we must have groups of trees for shelter, or rows for wind-breaks, where individual characteristics are lost. He liked the idea of planting vines to keep houses dry. The Kenilworth and English ivies are not suited to our climate; but we have a wealth of material in our native vines. The woodbine is more graceful than either of the two just mentioned. We want sunlight, and must take care not to make our houses damp by planting trees too near. He had seen cases where he would have put the axe to trees, because they were too near the house. He liked the elm for a roadside tree or to grow near a house, because it is not dense like the maples, but lofty and open so as to admit air beneath.

Dr. Bowen said that he was not a professional landscape gardener. His idea is that even the simplest country dweller, living in the humblest home, can render his abode as attractive as any of the cottage homes of England, of whose beauty so much has been said; and this would not be expensive, for the materials are near at hand.

John G. Barker said that the suggestions of the essayist are such as we shall all agree to. He lives in a brick house covered with *Ampelopsis Veitchii*, which is better than paint. He did not know that the vines made any perceptible difference in the dampness, but they improved the appearance very much. The remarks made in regard to planting trees near houses reminded him of a plan made for improving the grounds around his house, which included a clump of white pines on the northeast side, that would have shut off the view from the dining room and sitting room windows. He made a yard which it was desired to hide from view, and here a trellis was built, in front of which were planted lilacs, *Hydrangea paniculata grandiflora*, Paul's scarlet thorn and other shrubs; and, in front of these, herbaceous plants, some of which are in flower from early spring to autumn. He can sit at the second story window and look over the tops of the shrubs.

We are too apt to do what others say and not to look round and work out plans for ourselves. A friend in the country had a stone wall, which he thought it best to remove and put a picket fence in its place; but there was plenty of woodbine round, and he was advised to plant this and clematis against the wall and let them run over it; he did so and was much pleased with the results. In the cemetery which the speaker has charge of, he was obliged to build a piece of stone wall, and this was covered in the same way with excellent effect. The woodbine needs a little pruning to keep it within bounds.

He agreed with Mr. Strong in regard to trees; there is nothing better than the American weeping elm, especially for broad streets. For streets, they are better than maples, but the latter are proper for lawns. There are some tulip trees in East Saugus, which are very beautiful, especially when in flower. Their upright growth adapts them for narrow streets. The superintendent of tree planting in Lynn has come to the conclusion that young trees are better than large ones cut down. The trouble with many people is that their faculty of adaptation is never developed. The speaker advised any one who is thinking of planting trees to take the catalogue of some nurseryman who has a good variety, and go to the nursery and make notes of what is best adapted to the purpose in view; or, better still, to go to the Arnold Arboretum. It is astonishing what an amount of valuable information we are to have from that source for the mere trouble of going and getting it, or, indeed, how much can now be obtained. He felt grateful to the Committee for having brought the subject of the essay before the Society.

Col. Henry W. Wilson said that the whole genius of our age is against planting trees, on account of the slow returns from them. The black walnut and white pine do not reach perfection for lumber until they are over a hundred years old. Men cut down pine trees as soon as they will bring eight dollars per thousand for box boards. Our people are possessed by the spirit of unrest; when they plant corn they want to see it up the day after to-morrow.

The question is how to show, to men who want trees for ornament, some means of getting large handsome trees speedily. A man does not generally feel justified in making a country residence before he is fifty years old, and then his expectation of life is only twenty years. Fine trees are often destroyed in laying out streets,

or can be found in pastures of a size ordinarily considered too large to be transplanted, but with sufficient care they might be safely removed, and would produce an immediate effect. The speaker had often transplanted large trees with success. It is a beautiful thing to take a tree six, eight, or ten inches in diameter, which would perhaps otherwise be destroyed, and put it where it is wanted, and do the work in such a manner that in a year it would not be known that it had been transplanted. The late Hon. Josiah Quincy planted an orchard in his old age, and lived to eat of the fruit for twenty-five years. It is important in planting trees to attend to the location and condition of the soil; they love moisture, and evergreens are often supposed to have been winter-killed when in reality they have died of drought. But they must have drainage, for a superfluity of moisture is equally deleterious. If, after the holes are dug, they are found full of water, another location should be selected, for no tree will grow in stagnant water. One must either be familiar with these points or procure the services of a competent person.

Col. Wilson advised the planting of trees that will bear nuts; he loves to go nutting still. He would plant grafted trees of some fine variety of chestnut or other nuts, rather than to raise them from seed, and then he would be sure of getting fine nuts. There are many places in New England where the black walnut will flourish.

There are many estates that require wind-breaks. People plant grape vines in exposed places and the leaves are broken by winds, and also evaporate more water than they would in a sheltered place, and are attacked by mildew. Grapes cannot be brought to the highest perfection except in still air. In encouraging the planting and growth of trees will be found the hope of establishing homes.

Our cities ought to own the lands upon which rainfall is gathered for their water supply, and keep them covered with forest trees, thus preventing pollution at the source. The money that has been spent by the city of Boston in other directions to secure the purity of the water supply, would have bought a hundred thousand acres of land.

Notice was given that on the next Saturday John G. Barker would read a paper on "The Care and Embellishment of Cemeteries."

BUSINESS MEETING.

SATURDAY, March 20, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

No business being brought before the meeting, it adjourned to Saturday, March 27.

MEETING FOR DISCUSSION.

THE CARE AND EMBELLISHMENT OF CEMETERIES.

By JOHN G. BARKER, Superintendent of Pine Grove Cemetery, Lynn.*

In approaching the subject assigned for our consideration to-day, it will not be out of place to look first of all at some of the cemeteries in foreign lands, and glance very briefly at the history of their origin; especially as this Society is recognized as the originator in the first "garden cemetery" in this country. It is admitted, however, that the idea had been already carried into effect in other countries, some time prior to the establishment of Mount Auburn.

Mr. Loudon, in his "Encyclopedia of Gardening," says: "The cemeteries of the Jews may be considered as a species of garden. We find that Abraham, when Sarah died, purchased from the children of Heth a 'field, and all the trees which were within its limits, or on its borders' as a place of burial. It appears, from Abraham having declined the choice of any of the sepulchres of Heth, and fixed on a spot ornamented with trees, that burial-places in those days were considered scenes of beauty, as well as of mournful associations. The idea is confirmed by the circumstance of the sepulchre in which our Saviour was laid being in a garden."

It is also said in the work above quoted that, in the Netherlands, cemetery gardens were first commenced by the emperor Joseph; but they did not for a long time become common, though trees were frequently planted in churchyards.

No one, I suppose, who has ever been in Paris, or ever read of it, is without some knowledge of Père la Chaise; which was set apart as a cemetery, after an act had been passed by the French

* Since this paper was read Mr. Barker has been appointed Superintendent of Forest Hills Cemetery, Boston.

legislature prohibiting burials within the precincts of towns, and was first used in 1804. Concerning it I should say that, although many shrubs and flowers are used for decorative purposes within its limits, yet it is in fact anything but a garden cemetery, for it is said that between 1804 and 1832 nearly thirty thousand monuments were erected within it. "This burial ground," Hazlitt observes, "is tricked out and overacted, as if there were nothing sacred from impertinence and affectation." Mr. A. Strauch says on this point: "It is calculated that over one hundred millions of francs have been expended in the erection of monuments to the dead; many of them are, however, disfigured by ridiculous inscriptions and other ornamental puerilities." He says further: "It may perhaps be justly contended that the rivalry of art which abounds here weakens the effect which the solemn character of the place ought to inspire." Indeed many of my own personal friends who have visited Paris corroborate this statement, and say that amongst all the cemeteries of Paris, though they are richer in works of art than ours, none display that beautiful alliance of nature and art which may often be found in our own.

The English cemetery at Lisbon is said to be very picturesque. It contains a handsome chapel, and is planted largely with pine trees, and adorned with shrubs and flowers.

The practice of the continent, in removing burial places from towns to the country, was first imitated in England about the year 1825. Among the earliest examples was one near Liverpool; and others were formed at Birmingham, Manchester, and other large cities and towns throughout the country. The principal London cemeteries are those at Kensal Green (begun in 1834), the West London, Highgate, Abney Park, Nunhead, Tower Hamlets, and Norwood; all of which are laid out and planted with ornamental trees and shrubs — most of them with a view to picturesque effect. Later many have sprung up, in various parts of England, laid out on the landscape lawn plan, which are in striking contrast with the old churchyard burial grounds; partaking more of our own rural cemetery style.

It is unnecessary at this time to make more than brief allusion to our own Mount Auburn. The narrative of its origin already in print in the HISTORY OF THE SOCIETY, and undoubtedly familiar to you, needs no repetition, and the object sought to be secured in its establishment is also familiar to you all. Those of us who, though

having had no part in its formation, are permitted to contemplate the noble result owe a perpetual debt of gratitude to the projectors of this enterprise, the influence of which has pervaded the entire country.

But I am to speak to you more particularly on the Care and Embellishment of Cemeteries. Did time permit, I should attempt to give some thoughts relating to the Laying Out of cemeteries more particularly than is possible in this paper; for, in the care of any place, much depends on whether or not it is judiciously laid out in the beginning. A proper understanding of this dependence, or in other words a proper regard for the future, is a point every intelligent landscape gardener should study. Only a few miles from here, in a town where, around the houses of many of the residents, good taste prevails to a unusual degree, I could take you to a small cemetery so injudiciously laid out, with so many needless avenues and paths, that in keeping it merely tidy more than double the amount of labor is required that a place of that size ought to take; and I am sure I make no misrepresentation when I say one-third of the land is wasted. Thus it happens that in compiling accounts of actual outlay in care and maintenance of grounds, we often remark the great cost of the care of some as compared with that of others, of nearly or exactly the same size; there being so many circumstances that differ in any two places compared.

Unless in the case of a flat surface, it is impossible to lay out any cemetery to the best advantage without first viewing the grounds. Any location, be it ever so small, should be seen with all its surroundings before a stake is driven; and before any plan is adopted we should be sure it is what we want. In other words, I should reverse the usual order of work; I should say the grounds for a cemetery should be laid out first, and the plan made last.

There are those who palm themselves off as landscape gardeners, yet cannot lay out two places differently if their lives depended upon it—when you have seen their plan of one place, you get at one look all they have in them; and I can assure you I do not say this at hap-hazard. Some men's bump of adaptation, if they ever had any, seems never to have got developed.

It requires something more than a city office, or the accident of an acquaintance with some influential trustee or lot holder, to enable one to lay out a place for the whole future as well as the

present, and in a manner that will always be acceptable. And is it not true that, in some places under such influence as I have indicated, we witness in our visits a piece of mere heterogeneous botch work; where trees, shrubs, plants, and flowers are huddled in together, without any regard to habit of growth, taste in arrangement, or anything else? And this is called landscape gardening! And when these trees, shrubs, etc. are grown up, who can wonder that even the ordinary man who does his own thinking is dissatisfied? I think it is not difficult to see how it is that some other places look better than such as these.

Of course every cemetery has an entrance of some kind; and let me say, right here, this is the very place where a diligent care of the grounds should be at once apparent. Our visitors are brought there by no ordinary circumstance of life; and we should always be careful that their first impression is cheerful and pleasant. I would make it so attractive, and keep it so neat, that the thoughts and emotions of the person would at once be relieved of gloom, and refreshed by the joyful contemplation of a bright and happy scene.

Be sure of this first impression; but do not stop here—do not expend so much of your energies here that you must neglect the rest of the grounds. Wherever you can plant a rare tree, or a group of nice shrubs, or a bed of flowers, do so; and do not let the marble and granite monopolize the ground anywhere.

A few weeks ago a friend asked me, "Do you ever go to such a place?" "Yes, I have been there," was my answer. "Well," he continued, "I was there a short time ago. The entrance looked nice, and our expectations were all excited; but really that was all there was to it!" Now just imagine such a feeling—one transient good impression at first, and nothing more. We want a sustained impression; good at first, and good all the way through.

Most of our larger cemeteries have adopted the plan of setting apart, at the sale of every lot, a portion of the purchase money, which shall constitute a fund for the perpetual care of the same. The advantages of this plan at once commend it to every purchaser; and it is greatly to be regretted, in the case of many of our cemetery corporations, that they did not have foresight sufficient to add this feature long ago. It will need no extended argument to convince every close observer that a provision for the per-

petual care of every lot, combined with the lawn plan of laying out the grounds, makes it much easier to care for them than when they are laid out in the old style, and with liberty to every purchaser to establish his own grade, so that one lot is high and another low. As I am writing I call to mind a cemetery, a portion of which is quite level, and yet on this very part the amount of filling put in is so great that the paths have the appearance of ditches, more than anything else; and long flights of steps are necessarily provided to very many of the lots to make them accessible; and the interments cannot be more than a foot or two, if so much, below the grade of the avenues and paths. Imagine this to take care of!

Have not I succeeded in showing why it is that a man can do double and in some cases treble the effective work, where the grounds are laid out on the lawn plan? In the one case there is a bank or terrace to nearly every lot that he works on, and the sickle is in constant use; in the other, he has little use for anything but his mowing machine and the wooden lawn grass rake. Again, remember that, under our hot suns in July and August, nothing can be more unsightly than a long extent of dried up sunburnt banks and terraces. Considering all these facts, are we not justified in advocating the landscape lawn plan, both for effectiveness and economy, in the care of our cemeteries?

Practical experience teaches me that an all-important point, in the care of our cemeteries, is a proper division of the work. For years I have laid out our work in sections; assigning two men only to a section. Their duty is to keep all lots trimmed and quite clean, the flower beds free from weeds, and the vases watered; and (when the grass does not grow so fast as to keep them constantly busy) they are also expected to keep the paths and avenues clean, in their respective sections. I hold one of these two men responsible for the work; and, by so doing, if I see a neglected lot at any time, I know just whom to go to about it. He cannot tell me—"I did not do that last." I try to have a general oversight of the work, examamining it myself once every day, and twice if other duties do not prevent me. I think it is well the Superintendent should be expected often; and sometimes it is well for him to go when he is not expected. To be still more explicit, I believe the Superintendent should as far as possible know everything that is going on, allow no one to stand between him and his men, and above all, if possi-

ble, know all his lot holders. He is the responsible man, and above all others, has need to be completely familiar with all the details of the place; and by this familiarity, together with habitual and systematic planning for his men, he is enabled to use to the very best advantage all the means at his command for the care of the place; and what is true of this department of work is also true of all others.

Having thus, though briefly and imperfectly, considered the Care of a cemetery, let us now turn to its Embellishment; though one is so much a part of the other that I may not succeed in keeping them distinct. I think we shall all agree that the Avenues and Paths are very important features. Those at the entrance should always be of a width proportionate to the surroundings; they should be well extended, and the curves easy. I have found that for the principal avenues, aside from those at the entrance, eighteen feet wide is a good standard to adopt; and three feet and six inches for the paths is quite sufficient. The surface should always be rounded enough to throw the water into the gutters. Nothing adds more to the appearance of a place than well kept avenues and paths, and nothing detracts more from it than neglected ones. A job well done is sure of giving good satisfaction; and work of this kind should be of the best.

Wherever it is necessary, and at the same time feasible, to carry off the water, it will be found best to lay a drain pipe in the avenue along its border — a foot deep is enough — with a catch basin at that part where the most water concentrates; so carrying it to the most accessible point of discharge. This is preferable to paved gutters, especially where good stones cannot be obtained for the work. A nicely paved gutter of selected beach stones, of uniform size, makes a handsome finish sometimes; but they cannot be obtained everywhere.

As all cemeteries have more or less of paved gutters, it may not be amiss to speak here of their care. It may be thought that these are very expensive to keep clean, but it is not so; it is very seldom that they have to be weeded by hand. When the grounds have their spring raking up or cleaning, the gutters should be thoroughly swept with a stiff broom. This is generally in the latter part of April; after that, I always keep three barrels of brine on hand, and—weeds or no weeds—these gutters are watered with it once in two weeks; and with an occasional sweeping they are

always clean. Use it always on a bright sunny day. This is an easy and very satisfactory way of caring for the gutters; an experience of several years supports my statement. I think this is an important point to attend to in the care of our cemeteries; for, no matter how thoroughly you may do all the rest, if you neglect this it will detract more from the appearance of the grounds than can be made up by any efforts whatever towards other embellishment.

The edges of the avenues and paths should never be so high as to attract notice; keep them low, but properly defined; use the scuffle hoe and fine rake freely when the weeds are scarcely perceptible, and you will be surprised to see what a distance two men can go over in a day.

You will expect to hear something about the Lots; and I remark, first of all, that without good grass you may plant whatever else you please, and yet never have a good looking lot. Let all the ground be well prepared; do not be disturbed if the compost heap is reduced. Before sowing, give the seed something to feed on. I cannot recommend attention to this work too strongly. I know by sad experience the great drawbacks from the want of thorough preparation. Proprietors whose lots were graded years ago, and who have them cared for by the year, are surprised that theirs do not look as well as many others; the fact being that, at the time those lots were graded, the work was usually let out by the individual purchaser to the man who would do it cheapest; while now every lot, in any well conducted cemetery, is thoroughly prepared before it is sold.

I have in my mind an owner of a large well laid out lot, who is willing to pay any reasonable bill for the care of it. On that lot there is not over four inches of good soil. He is willing to top-dress it — but I have not persuasive power enough to get his consent to make thorough work, by taking out the gravel and replacing with good loam and manure, and then seeding down anew. Top dressing is good, but food for the deep roots is better; a dry spell will soon convince a close observer of this fact. By all means let us have good grassing.

As long as time lasts, I suppose marble and granite will be used for decorative, as well as for memorial purposes. We scarcely ever think how little the original intention of the projectors of Mount Auburn was conformed to, during the many years when

fences and granite curbings were permitted to surround the lots, giving it more the appearance of a marble and granite yard than anything else; especially when viewed from a distance. It is not until within a few years, comparatively speaking, that the landscape lawn plan has been carried out there. It certainly is a delightful spot; but only imagine how much more charming a place it would be, were the whole of these naturally beautiful grounds brought into accordance with the intentions of its founders.

Happily many of the old unsightly hedges and fences are giving way, each year, to grassy slopes and rare trees and shrubs; so that in this modern style the views of the founders are becoming realized. I make these remarks in friendly criticism and not in a captious spirit.

Not long ago a lady, who owned a small lot, said to me: "I want some shrubs, or plants, or both, on my lot; what do you advise?"— In the centre was set a weeping Kilmarnock Willow (which can be easily removed if a monument is erected), and on each front corner a plant of *Yucca aloifolia*; with a Spiræa and a Hydrangea placed near the back corners, in the space in the rear of the lot. Properly cared for, this simple arrangement will look well for years to come.

I do not advise flower beds on lots, although many wish for them, but I do think a good-sized vase, well filled, and placed in the centre of the lot (especially where there is no monument), is very desirable.

So far, I have referred more particularly to small lots. Of course larger ones will admit of more extended work; but still the principles for treating small lots will apply to larger ones. We must remember, of course, to attain all the variety we can in the embellishment introduced; and yet also that an effect of neatness and simplicity is what we should equally strive to secure; and that anything like ostentation is entirely out of place.

It is a good thing that tastes and customs change. We all feel how much better it looks to see on a large lot, or indeed on a lot of any size, one handsome monument, with simple markers set at each grave to designate whose it is—than a quantity of head-stones, some of one design and some of another, such as were once common. A superintendent's advice is often sought on this very point. Sometimes the matter is presented in this way: "I have a lot in the old part of the cemetery. I inherited it from my father.

I want to improve it and I do not know what to do with it. It looks bad; still I dislike to disturb what my father did." This I know is an ill-advised sentiment; and I would take that friend and reason with him, as kindly as I know how, and would show him, by what had been done on other old lots, what his might be and ought to be made. By taking this course, if he is really in earnest, you can usually win him to your views: but be assured it will take kindness, and not "you must," to gain your end.

I can show you a beautiful vista where once was an assemblage of unsightly hedges and iron fences, with ragged banks and terraces, half dead trees and scraggy shrubs. We now have there a range of well kept lots, with vases and beds of flowers, and choice trees and shrubs; the whole area is a pleasure to all, and not one of the several proprietors would restore its former condition on any account. It took time, of course, to accomplish this result. But it has been done, and this single example has done more to influence others to make like changes than any amount of argument could possibly have done.

On the larger lots, of a thousand or more square feet, a good way is to form a circle, described about the centre of the lot. This will leave spaces in the back and front corners, which may be planted, if you please, with Cut-Leaved Birch on the back corners, *Deutzia gracilis* in the front, or *Yucca aloifolia*, or anything to suit your taste, if not of too strong growth; place a tree in the centre, to occupy it until you are ready with your monument. This idea I gain from a plan in my possession, furnished from Spring Grove Cemetery, at Cincinnati.

It is a good practice, adopted in many cemeteries, to furnish every owner with a plan of his lot drawn to a scale; and cause all the graves to be correctly defined upon it. A book of duplicates of these plans is kept at the office of the cemetery, one page being devoted to each lot. In this way all mistakes are prevented, even if there is neither monument nor headstone on the lot, as each successive interment is recorded on the proprietors' plan, and also on the book at the office.

While we cannot control all tastes we can influence very many. Some of you will say, Tell us how you do it. The first thing is to know your people, and find out what their wants are, and then adapt yourself to them.

I have tried to efface all lines implying the exclusiveness of

wealth; both in my own work, and outside of it as far as my influence could reach. Let me give you an idea of one section laid out this season.

The section is bounded by three avenues and a path; it is about 150 feet long by 112 feet wide. We will suppose ourselves standing on an avenue facing the section. All the front lots contain 300 square feet each, except one of 400. The borders are 5 feet wide; the lots 20 feet deep. Next, or in the rear of the front lots, is another space 5 feet wide, for trees; next, a width of 9 feet running the entire length, 150 feet; then a 2-foot border. Here is our single-grave section; then a path 3 feet and 6 inches wide, then another row of lots, 18 feet deep, with a border of 2 feet on both front and back; these lots are of 300 feet area. Next comes a path 3 feet and 6 inches wide; then, again, a border of 2 feet; then follows a 9-foot space. Here we have another single-grave section, and back of this is a space 5 feet wide for trees; again, lots 20 feet deep, with a border of 5 feet, bringing us to the avenues. These lots in the last tier contain 200 square feet each.

Now, what are the advantages of this plan? I reply, we have small and large lots together, and still separated from each other; we have uniformity, and ample space for trees and shrubs. Here the rich and poor will be laid together, and I never hear the remark, "Because I cannot buy a large lot, I am driven into a back corner," or a low place. Since the adoption of this plan, I have not heard one word of complaint from any source. Small lots we must have; and I think this plan admits them to much better advantage than where a large space is specially assigned for them alone, and the headstones are so close together that you find it a very difficult job to clean about them.

The planting of trees and shrubs, in the cemetery of which I have charge, is controlled entirely by the Trustees; and with "perpetual care" there is no reasonable objection to this restriction. Large trees are not planted on the avenues, but only between the lots, on the back of the front row. I follow substantially the same plan in all the sections, yet I never lay out two alike if I can avoid it. It is well to vary as much as you can, adapting yourself to the wants of the people; and if you adhere to the landscape lawn plan you can keep all unpleasantly distinctive lines out of sight, and maintain a uniform neatness throughout which no other system will allow.

For the embellishment of such spaces as are available for the purpose, I would recommend a free use of shrubs and herbaceous plants. I would never plant very close, but would let each have room to show what it is. This matter is one I should find difficulty in giving rules for. The best qualification I can think of is a good knowledge of trees, shrubs, and plants; this will be a great assistance in making successful and effective arrangements. Observe everywhere you go what will do well and what will not, and keep your note-book constantly by you. Few rules will apply everywhere. Never let the nurseryman's catalogue rule you; it may help your search, but go and see the plants for yourself, taking the catalogue with you; check what you find that you like, and when you are ready to order this will assist you much. Above all places go to the Arnold Arboretum, where everything is plainly named. Even one visit will save you many dollars, and much annoyance. You will discover that you need not experiment for yourself with unknown things; here you may see them growing — and free of expense. After this you will know how to buy and not be disappointed; you can be your own agent in purchasing, for you have seen nature in reality, and not on paper in chromo style.

I believe in massing the different kinds of flowering shrubs, but not in swamping them. But before any kind of planting is done, prepare your beds in the best possible way—it will pay to do it; and if you do not, disappointment will be your doom.

I have one ornamental piece, on a flat surface, seen on all sides. It is broad in the centre, and comes to a sharp point at either end. In the centre of the piece a *Sidisburia adiantifolia* is planted, and at each of the ends are six or eight plants of *Yucca aloifolia*. On the edges between the Yuccas at each end is a row of low-growing Phloxes—all seedlings. The spaces between the Phloxes on the sides and the Yuccas at the ends are filled in with *Hydrangea paniculata grandiflora;* the whole forms a very satisfactory bed.

Another prominent corner, of good size and triangular in shape, is planted as follows: at the point on the back, about thirty feet from the avenue, is a very fine specimen of *Virgilia lutea*; half way between this and the avenue is a Kilmarnock Willow, grafted high. Between these, and bordering two sides, are Spiræas, Wiegelas, *Deutzia scabra* and *D. crenata fl. pl.*, *Forsythia viridissima*, and *Hydrangea paniculata grandiflora;* and on the front *Deutzia gracilis*; these are all grown as specimen plants, and they

barely touch each other. A circle of five feet is kept open around each, and the grass spaces are cut at the same time with the lots on each side. I assure you this is a very satisfactory group of flowering shrubs. Other groups might be mentioned, but it would take more time, I am sure, than you would like to listen, and perhaps I have said enough to indicate my ideas of this part of the work.

I would plant single specimens of both trees and shrubs wherever there is space for them, if the condition of the treasury will permit. Do not be discouraged if you cannot set them all in one season; keep at it — plant some every year. Don't put them in hap-hazard; look out for effect, and get all the pleasing vistas you can; and you will be surprised to find what a few years of steady, persevering, faithful work will do.

If I am not mistaken, the great beauty of the celebrated Spring Grove Cemetery, at Cincinnati, is due largely to the skill and taste shown in the arrangement of the trees and shrubs; of which the late Mr. Strauch, the gifted landscape gardener and superintendent, made a special study. I am also informed that West Laurel Hill, Philadelphia, is particularly interesting on account of the beauty of the arrangement of the trees, and for this the name of John Jay Smith, the eminent horticulturist and warm hearted gentleman, whose love of the beautiful knew no bounds, will ever be held in grateful remembrance. This plan, I believe, was his last effort; and no more magnificent monument could perpetuate his memory.

I may mention not inappropriately as examples of cemeteries worthy of our attention—besides Mount Auburn, already named—Forest Hills, well known to all, and the delight of every one; Cedar Hill, Hartford, Ct., laid out on the plan of Spring Grove, Cincinnati, — most beautiful for situation; Swan Point, Providence, R. I., wonderfully improved under the superintendence of Mr. McCarty, well known to most of us; Woodlawn, at Chelsea, so successfully managed by our honored associate, H. Weld Fuller; and also Newton Cemetery, one of the prettiest of all suburban cemeteries, for which nature and art, here most beautifully combined through the admirable taste of Mr. Ross, the respected superintendent, have made a reputation extending far and wide. Doubtless many others might be mentioned, but these will suffice for this occasion.

In many of our cemeteries, especially those owned by the cities or towns in which they are located, a considerable area is occupied by what is known as the City or Town Lot. We know that our friends who are compelled, from necessity, to make the principal use of these public burial places are just as sensitive, and have just as much grief in the loss of kindred, as the most favored ones, who have means to do as they wish. Remembering this, we want no one to feel the dollar division in the cemetery; and how to avoid placing these humbler graves on one side, or isolating them, is a question that has perplexed us all.

In many of these places disorder seems the rule; in other words, every one does as he pleases. Large headstones are erected where there is too little room for them; elsewhere, unshapely wooden boxes or trellises are placed around graves, and are frequently left to decay and disfigure the grounds; and, not unfrequently, unsightly mounds are raised over the graves. It is not difficult to see why a lot that has been filled in this way is hard to keep in order. I have noticed that in some cemeteries hedges have been grown to surround these special burial-places; but I cannot commend that, for when you see such a hedged-in place, you are impelled to look inside, and the result invariably is a disappointment.

Let me ask you how it would work to establish and post up, to be seen, read, and obeyed by all, the following

Rules and Regulations Concerning Public Lots.

1. No graves in these lots can be reserved for future use.
2. No wooden structures of any kind will be allowed on these lots, unless it be for the protection of tablets or for the purpose of placing flowers in during the winter season.
3. No raised mounds over the graves in these lots will be allowed; but persons wishing to cultivate flowers upon them are invited to do so.
4. No headstone will be allowed over two feet wide at the base, or over three high from the grade of the lot; and the stone upon which the number of the grave is cut must be retained, unless the number is cut upon the headstone.

In addition to this, when an interment is made and you hand to the friends the card designating the place, date, etc., let these rules appear in print on the back of each card; and in this way

every one will be informed of them. An arrangement of this kind has greatly assisted us to keep our grounds at Lynn in an orderly condition.

There are a great many who will desire to cultivate flowers on the graves of their friends, and among them some who will ask what they shall plant. Very many have pansies—and with a deep cool soil, kept moist, they will flower long into hot weather. I would recommend setting a Geranium or two among them; and, if you like, edging with Daisies, or Forget-Me-Nots and Daisies, or *Echeveria secunda glauca* on the edge, with *Alternanthera paronychyoides* next; and, if there be room for a centre row, Geranium Crystal Palace Gem, or Santolina, will look well if the work is rightly done.

Some may want all hardy plants; in such cases the common Ground Myrtle or Periwinkle is most used, and is very satisfactory; the deep green leaves contrasting finely with the delicate blue flowers. The Ivy is also used; and when covered in winter and occasionally top dressed does very well; this can be edged with the small hardy *Euonymus radicans variegata*, and with a little trimming and care the whole will last many seasons without any transplanting. There is a pretty little Retinospora—*plumosa aurea*, I think it is—which is very bright, and would contrast beautifully with the Euonymus or the Ivy, and might be used to good advantage. I have not tried it, but observation justifies me in speaking of it. Another hardy plant, which I have read of but do not know, viz., *Campanula pusilla alba*, is highly recommended for planting on graves; and is said to produce a dense mass of pure white flowers. There undoubtedly are many other plants, as yet unknown to me, adapted for planting on graves; but I think I have said enough to prove, and trust I have convinced you, that our public burial grounds need not be places that people would rather avoid than visit.

Unless I make some allusion to the use of greenhouse and bedding plants, I shall hardly have fulfilled my task. We cannot visit any one of the many beautiful cemeteries in this vicinity without perceiving that the use of these plants adds very much to its attractiveness; although I am aware that it takes many months of labor to produce a bed which gives pleasure but a few brief weeks. I have both heard and seen in print some very severe criticisms on what may be called our summer mode of embellishment, denying

that we are repaid in the return we get for the amount we spend. I do not intend to discuss this point here, but I must say that careful observation compels me to admit that a greenhouse will prove a valuable adjunct to any cemetery. I think also that considering the comparative ease with which the usual style of bedding can be arranged, and the quickly effective results afforded by soft-wooded plants, the tendency, in a measure at least, to displace hardy plants is quite natural. We all know how quickly a bed of the former plants will look well. Indeed, if they are properly grown and well hardened off, so as not to lose their leaves after being turned out of the pots, they look well the moment the planting of the bed is finished; and I think this is the commendable point in their use. Nevertheless, I will venture this assertion — that a more thorough knowledge of the hardy plants and shrubs, on the part of those who lay out and have charge of our cemeteries (especially the smaller ones where a professional gardener is not employed), would be likely to add more of permament beauty and attractiveness to them than any one thing I could recommend. I confess that, until of late years, I have not appreciated their value. There are very few places where something could not be done in this way.

In a cemetery, not beyond the reach of any of us, a landscape gardener was employed to present plans for the improvement of a very sightly portion of the grounds, devoted not to burial but to ornamental purposes. The plan in due time was presented, and accepted by the trustees; and, as I have since seen it, I can assure you it made a beautiful picture; but before being executed it was placed in the hands of a competent person for criticism. As regards trees and shrubs, the criticism was based mainly on a report of a Special Committee of this Society, on the causes of the injuries to vegetation in the winter and spring of 1871-2; and, on consultation had with persons of acknowledged ability and much experience, it was concluded that not one-third of the trees and shrubs recommended on the plan for this particular place were in the least appropriate. A glance at the plan, by any experienced and practical man, would convince him that this was no prejudiced judgment. The criticism having been reported, orders were given to execute the plan as far as adapted to the location; and, where it was not, to make such changes in it as would contribute to the permanent beauty of the place. I might

tell you where it is, and you would, I feel sure, be welcome to go and see for yourself. A more thorough knowledge of the grounds and a little closer observation would have been of great help to the designer, and would have made his work more satisfactory. The bedding recommended in this plan was positively worthless.

But to resume the thread of my thoughts—I do think that, where more than one man is required for service in winter, a greenhouse can be carried on to good advantage; for a great deal of time in stormy and cold weather can be well employed there. Plants for vases and general ornamentation must or should be had in every well ordered place; and it is very much better to raise them, because then you can propagate just such ones as you know you would like for your next season's work, and be sure of having them on hand.

In the smaller places and where help is kept only a part of the time, it will be found that great improvement can often be made merely by keeping the fences all in order, the headstones all upright, the grass closely cut, and the avenues and paths perfectly clean. Let so much be done if nothing more, but if possible set out a few trees. If you cannot do all you want to at once, try again, and yet again—as many times as need be until your desires are accomplished, and in a few years you will be astonished to see how the whole appearance of the place has been changed. Many a town or village cemetery, now neglected, could be made a source of pleasure to all the people by a small annual expenditure; and no place is too poor to do something.

I believe we should use our influence as a Society in this direction; for a well kept cemetery is an efficient educator in any community, and does much to mould the tastes of those who visit or even merely pass by it.

Allow me to mention one instance. In the year 1874 I planted in groups and single specimens a few plants of *Hydrangea paniculata grandiflora;* these were certainly the first planted in Lynn, or for many miles around. When these plants bloomed, they were the admiration of every one; and when it was learned that they were thoroughly hardy scores and hundreds were sold, and the same is true of other shrubs and flowers. I could give you the names of several owners of large estates who have added to their collections shrubs and plants which they first saw growing in our cemetery, being attracted to them as they were driving by. More than once these occurrences have led to acquaintance and

friendship of the most delightful nature. On this point allow me to quote a few words from the pen of our countryman, the late A. J. Downing, who in writing to Loudon's (London) "Gardener's Magazine" said:

"Beside the three principal cemeteries of Boston, New York, and Philadelphia, there are at least a dozen others in progress in the neighborhood of other cities. It is remarkable that these cemeteries are the first really elegant public gardens or promenades formed in this country. In point of design, keeping, and in so far as respects the variety of rare flowering shrubs and trees introduced, they are much superior to the majority of country residences here, and may therefore be considered as likely to affect, in a very considerable degree, the general taste for laying out and embellishing grounds. Hundreds of the citizens who ramble through them form perhaps their first acquaintance with many species of plants there, and apply the taste thus acquired to their own gardens."

It is just forty-seven years ago since these views were expressed, and however true then they are perhaps doubly so now. There is no one thing that we so much under-estimate as our influence over others. Let us plant right that others may be rightly guided; let our tastes be such as others can safely follow; let us select such trees, plants, and shrubs as will withstand the changes and severity of our climate. Others will do the same and so will be saved from following, to the doom of bitter disappointment, the misguided many who purchase under the seduction of gorgeous chromos, and from agents with whom they are unacquainted. Our cemeteries, even more than our public parks (as there are many of the former where there are few of the latter), may be made public educators, and so benefactors, of the masses, when occasion brings them to visit and contemplate these most sacred and dear of all spots on earth.

I have tried to think what general rules or maxims could be suggested, in condensed form, by way of help to such as are interested in the subject under consideration. Perhaps I cannot do better than reproduce to you some advice offered by our late Corresponding Member, Dr. John A. Warder. It is certainly practical, and will reward our attention even if we do not agree to all of it. Regarding cemeteries, Dr. Warder wrote:

"*First.* There should be perfect security and permanence in the title and against intrusion,

Second, Insuring peaceful quiet and perfect repose to all who may be brought within the sacred limits.

Third. The landscape should embrace a diversified surface of land and water.

Fourth. The area should be covered with green turf in broad stretches,

Fifth, Shaded by umbrageous trees, singly distributed at intervals or in open groups,

Sixth, And reaching on either side to masses of foliage of different hues, deciduous or evergreen, according to the situation. The outside boundaries should be concealed by these; and, at the same time, from various commanding eminences, open and unobstructed vistas across the demesne, and to distant objects of interest, should be carefully preserved.

Seventh. Easy access to all parts of the grounds should be provided by smooth, hard roads and paths, kept in perfect order.

Eighth. Of all things and above all, we should enjoin severe simplicity and strictly good taste in the decoration of the graves, and the mementoes offered to the dear departed ones.

Ninth. In the modern rural cemetery we want no selfish, repellent, and obtrusive fences as enclosures to our lots, ever decaying and ever reminding us of the egotistical claims and pretensions of individuals, in this common meeting place of rich and poor, where all of us, from the highest to the lowest, are at last reduced to a common level, and to a condition in which there is and should be no respect of persons.

Tenth. Lastly, and in connection with the sentiments already presented, as appropriate accompaniments and conditions of the sacred precincts of the cemetery, let us carefully avoid another great danger that is incurred in our desire to pay due respect to the memory of our dead—let us avoid making such a sacred spot appear to be only one vast advertisement of the stone cutter's thriving trade. Instead of this constant repetition of granite and marble, shaft and obelisk, of pretentious mausoleum or cenotaph, some persons will prefer to place a mass of native rock, partially faced for an inscription. Others again will prefer to mark the spot, most dear of all the earth beside, by planting a memorial tree to mark the last resting place of their dear departed friends."

Perhaps we cannot follow out all these ideas to the letter, they being intended especially for new cemeteries; but certainly they

will help us in the attainment of what may be feasible. I cannot say that I agree, to the letter, with all these suggestions; but they are so good on the whole that I feel quite safe in quoting them in this connection.

I would again advise, no matter how small the place, never to start a new cemetery without some arrangement for the perpetual care of all the grounds. This is of too great importance to be neglected; for, as I have already said, however well your grounds are planned the entire beauty will soon be lost if this has been left without due provision. Take care also that no slovenly, unskilful person has charge of your new cemetery; the whole community are interested in its proper maintenance, and it is little less than sacrilege to place it in charge of an incompetent man; as may be seen by the way some are managed. I have read that the clown in "Hamlet" served as a grave digger, but he was hardly the man to have charge of a cemetery.

Mr. President, Ladies, and Gentlemen: I hope I have not tired you all out by taking so much time; and yet I feel that I have hardly begun, there is so much to be said on this subject. It is one in which we all have a common interest. My own heart is in the work; and if I have succeeded in saying anything to promote in any way the Care and Embellishment of our Cemeteries, I shall feel grateful to the Committee for assigning to me the duty that I fear I have so poorly performed today.

Discussion.

Samuel A. B. Bragg was called on and said that the paper read had covered the ground so fully that he could hardly add anything. He was formerly Superintendent of Mount Hope Cemetery, and when there received visits from the Garden Committee of this Society, whose members gave him many valuable suggestions. He was particularly struck with the account, in Mr. Barker's paper, of the man who wanted his lot improved, but did not want the headstones removed. He had himself had such a case; the lot looked well in spring, but soon dried up and looked worse than the roadside; in some places the soil was only three inches deep.

He thought the essayist seemed inclined to plant rather too many trees and shrubs in lots. In his experience many lot owners inclined to planting too many or too large trees and shrubs, and he

was obliged to discourage it. The Sugar Maple is about the only shade tree suitable for planting in cemeteries. It is clean and never soils the tablets. Mr. Barker recommended planting the trees well back from the avenues, but the object of the speaker was to shade the avenues. They were formerly planted back from the avenues at Mount Hope, but he changed the plan and set them at about six feet from the avenues and trimmed them up to twelve feet; and was laughed at, but in a few years the aspect changed; the trees were not too near the avenues, and the sun could shine on the grass. A mistake was made in the old parts of the cemetery in allowing the limbs of trees to grow too low, and to shade the ground so much that there was no green grass under them. He used to talk with Mr. Moulton, the Superintendent of Forest Hills Cemetery, on this point, and he was finally convinced and pruned up the old trees, and the young ones as they were planted.

One of the trustees of the Cemetery had Norway spruce and maple trees set so closely around his own house that the speaker wanted him to take away some of them, and prune up others, so as to give a view of the Blue Hills. Before long, the spruces came away and the maples were trimmed up. This was six or seven years ago, and the gentleman has lived there since that time and kept up an open wood fire without buying any wood.

At Mount Hope Cemetery, which belongs to the City of Boston, there is a pauper lot; another where friends pay the cost of digging graves, and a third where single graves are sold for about twelve dollars each. In the first two lots no tablets are allowed, but the graves are all levelled off and designated only by little markers; in the third tablets are allowed, but are restricted to thirty-two inches in height and two feet in width, and no wooden structure of any kind is permitted. One exception to this last rule was made, in the case of a little wooden tablet describing the vacancy in the home, caused by the departure of the sleeper beneath. If all rules were carried out to the letter it might sometimes lead to harsh and arbitrary treatment.

Warren H. Manning said that there might be a difference of opinion in regard to planting trees in cemeteries, but he thought they were apt to be too thick; as at Mount Auburn. Vistas should be left open; and the trees should not be so thick that the grass will not grow under them. The trustees of cemeteries have power

to remove trees, and to prohibit the planting of them where it is judged that they will be too close.

Mr. Barker did not wish to be understood as advocating the planting of too many trees. If those present should visit Pine Grove Cemetery they might think the trees are not thick enough. In the old parts the avenues are damp; but he had tried to plant the new ones so that neither he nor his sucessors would be obliged to thin out. Certainly there have been more mistakes made in planting too many trees than too few. No man can take a plan and sit down in his office and mark the positions of trees; he must know what people want. Nor can avenues be laid out to advantage without regard to the contour of the ground. If avenues are put in proper places great saving may be made in the cost of grading. The planting of trees and the laying out of paths and avenues must both be adaped to the ground.

Samuel Hartwell said that the town of Lincoln, where he resides, has lately established a new cemetery where there are many huckleberry bushes, and he wanted to know how to eradicate them. The ground has been surveyed and a plan made, and five thousand feet of roads built at a cost of two thousand dollars. One acre of the ground is quite heavily wooded with oaks and maples, and he wanted to know how to treat them to the best advantage.

Mr. Barker said that nothing could be more beautiful than the old trees described by the preceding speaker. At Oak Hill Cemetery, Georgetown, D. C., such trees have been retained, and paths have sometimes been curved to save a fine tree even at the expense of losing a lot. At Pine Grove Cemetery there are so many stones that they are obliged to trench the whole ground five feet deep to get rid of them, and all huckleberry bushes and similar growths are effectually destroyed in this operation. In the landscape lawn system the lots are marked by a stone post six or eight inches square at each corner, the top being set even with the surface of the ground.

O. B. Hadwen said that he did not feel competent to discuss the paper, but its value would be appreciated when printed in our TRANSACTIONS. It affords much information on a subject of which little is known, and when lot owners understand the situation there will be less annoyance and trouble to the superintendents of cemeteries, where all must sooner or later go.

Mr. Hadwen, as Chairman of the Committee on Discussions, announced for the next Saturday a paper by Professor G. C. Caldwell, of Cornell University, Ithaca, N. Y., on "Nitrogen: Why the crops must have it and where they must get it."

BUSINESS MEETING.

SATURDAY, March 27, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

No business being brought before the meeting it was dissolved.

MEETING FOR DISCUSSION.

NITROGEN: WHY THE CROPS MUST HAVE IT AND WHERE THEY MUST GET IT.

By PROFESSOR G. C. CALDWELL, Ithaca, N. Y.

In beginning the study of the atmosphere as a source of supply of the nitrogen of vegetation, we are at once confronted with the familiar fact of the abundance of this substance existing there in the free or chemically uncombined state, it being simply mixed with the oxygen; which is also present in large quantity. This supply of nitrogen would furnish, if the crops could use it, an amount a hundred thousand times greater than the most greedy of them could dispose of. The first question which it is natural that we should consider is, Cannot plants force this free nitrogen into those chemical combinations containing nitrogen, which form such an all-important part of the contents of their cells, and for producing which they must have nitrogenous food of some kind?

It ought not to be necessary to discuss this question now. It has been demonstrated, by the most competent investigators who have ever entered the field of agricultural research, that plants cannot assimilate the free nitrogen of the atmosphere—that, in other words, while it is in the free or chemically uncombined state, it is of no use whatever for plant food. Boussingault, in France, now one of the oldest living chemists of renown—whose work commands the highest confidence throughout the chemical world—was the first to investigate this great question in such a manner as

to get convincing results. Many years later Lawes and Gilbert, of England—whose work for the advancement of agriculture is known, respected, and implicitly trusted wherever there are farmers who read and think—associating with themselves the late Dr. Pugh, who, after his return to this country from his studies in Europe, broke himself down in his herculean efforts to build up an agricultural college in Pennsylvania, obtained results fully confirming those of Boussingault.

But it may be asked, If Boussingault had settled the question so conclusively, what was the need of its being investigated again, at such lavish expense and with such great care?

It was because, unfortunately, another man had meanwhile attacked the difficult problem, and had reported results diametrically opposite. This man was Georges Ville, a Frenchman, of whose training as a chemist and an investigator we have no very satisfactory information. It is said that he was a watchmaker by trade, and Napoleon III, in gratitude for political services rendered, gave him the charge of an important agricultural institution near Paris.

He is a ready writer, and has given us a book on manures, which has been translated and published in this country as well as in England. The work contains many ideas that take with the farmers, and there is really much in it that is good for them to read. A second edition of this work was issued a year or two ago; the attention of the author had been called to a number of errors in his first edition, so plain that he could not deny that they were such; yet he refused to allow them to be corrected, insisting that the book should be published just as it was at first, mistakes and all. This little incident, related to me by Dr. Gilbert when in this country a short time ago, shows how much regard this investigator and agricultural instructor has for the truth.

This work contains the doctrine of the assimilability of the free nitrogen of the atmosphere; and this makes the book popular, for it is a popular doctrine with the average intelligent farmer who gives any thought to the question of the nitrogen supply, and who believes in the renovating virtue of clover. And there are some who believe in the doctrine apparently because they think it ought to be so. A prominent agricultural investigator, now in charge of an important experiment station in this country, is recently

quoted, by the horticulturist to whom he made the remark, as follows: "While the question is not settled, I am inclined to the opinion that, if nature in furnishing so abundant a supply did not give plants the ability to use it, she is not so wise as she is represented." While intelligent men think and talk in this way, it is not out of place to discuss this very important question, and see what grounds there are for the doctrine to rest upon. If it is wrong it is pernicious, as all wrong doctrines are, and it should be exposed.

These researches were carried out by all the parties on the same general plan. The plants were grown in soils containing either no nitrogen compounds at all, or accurately known quantities; so that it could be determined at the end of the experiment just how much nitrogen the crop had gained from that source. Taking account of the fact that the atmospheric air always contains a small quantity of nitrogen compounds, besides its large quantity of uncombined nitrogen, the plants were supplied either with measured quantities of air, so that the possible amount of combined nitrogen that they could get from that source could be estimated; or they were supplied with washed air from which all combined nitrogen had been removed, so that they could get none at all from that source. The amount of combined nitrogen in the seed was determined by careful analysis of a sample of the kind of seed planted. At the end of the experiment the whole quantity of combined nitrogen in the products was no less carefully determined, by the usual methods of chemical analysis. Evidently, if the combined nitrogen in the products of the experiment exceeded that in the soil, seed, and air from which the plant could get its supplies of food, then free, uncombined nitrogen must have been forced into combination during the growth of the plant.

Boussingault's first experiments, in 1837, '38, and '39, were not so carefully conducted as his later ones in 1851, '52, and '53; the plants were grown in free air, but protected from the rain, from which they might otherwise have obtained a considerable quantity of combined nitrogen. Clover appeared to be able to gain nitrogen, over and above what was supplied to it, but oats gained none. But, since the clover had access to a certain though exceedingly small amount of combined nitrogen in the air with which it was in free contact, there is no proof here, as Boussin-

gault himself allowed, that there was any assimilation of free nitrogen. In his later series, the plants were supplied with air previously deprived of all compounds of nitrogen; and this time neither leguminous nor cereal plants made any gain in nitrogen.

Ville's experiments were carried on from 1851 to 1856. In these, several plants were grown together in a large, iron-framed glazed case. His results were various; in the case of some plants and some series of trials there was no gain of nitrogen; in others there was a gain, amounting to from four to five times as much as was contained in the seed and any other accessible supply. In still other cases there was forty times as much combined nitrogen in the crop as was supplied. The power of gaining nitrogen was not confined to leguminous plants, although they seemed to possess it in greater degree than the cereals — wheat, rye, or Indian corn. These startling contradictions of the results obtained by the well known Boussingault excited so much interest that a committee of the French Academy of Sciences, one of the most renowned scientific associations in the world, was delegated to watch over some new experiments made by Ville. After discharging their duty as well as they could, for they could not be expected to keep watch at all hours of the day and night during a three months period of growth of the experimental plants, they could state no other conclusion than that this new experiment, made by Ville under their supervision, was consistent with the conclusions that he had drawn from his previous labors.

Finally, in 1857, '58, and '59, seeing that it certainly could not be considered as a settled question, Lawes, Gilbert, and Pugh took the subject in hand. I wish I could take the time to show here how carefully they went to work to guard their experiments from all possible sources of error; for then your conviction might be as firm as mine, that free nitrogen is no food for plants. Let it suffice now to say that Boussingault, accepting their invitation to visit them while the experiments were in progress, was so well satisfied with the manner in which the work was conducted, as to declare that he would abide by their results, whatever they should turn out to be. Ville was also invited over to inspect their methods, but he never came. He was, however, prevailed upon to send over the identical case in which his own experiments were conducted, and in which such remarkable gains of nitrogen were made.

As to the results of these last experiments, as has been already stated, they fully confirmed those obtained by Boussingault, and that renowned investigator could accept them without any change of his own views. And one of the most interesting features of these results was that, in Ville's iron-framed glazed case, they were precisely the same as under the glass shades used in the English experiments — there was a complete failure to get, not merely the large gains of nitrogen that Ville reported, but any gains at all. There were twelve of these shades, each nine inches in diameter and forty inches high, and with several plants under it, standing in a row, flanked by Ville's case. In order to show that all the necessary conditions for successful plant growth, except a supply of combined nitrogen, were fulfilled under these shades, several seeds were planted in a pot of garden soil, and put under one of them, and subjected to the same treatment during growth as the plants under the other shades; the growth of these plants from these seeds was as healthy and normal as could be expected where they were so much crowded, and it was conclusively shown that nothing was lacking but room for their free development.

Still some skeptics might say that if you should only allow a better chance to the plant, by giving it a vigorous start in the beginning, it might then be able to do what it could not do if starved and stunted from the outset in a barren soil. In order to meet such a criticism, the plants under some of the shades were supplied with a known quantity of ammonia salts, containing a known quantity of nitrogen, several times during the season; but, although these plants grew more vigorously than those which received no other nitrogen than that contained in the seed planted, there was yet no gain of nitrogen over and above what was thus supplied.

The question now naturally arises, How did Ville get such results, and especially how did he succeed in convincing the committee of the French Academy that his results were correct, when conducting another experiment under their watchful inspection? How is it possible that the same apparatus should have yielded one result in Paris and another at Rothamstead in England? Can it be possible that Parisian nitrogen is any more easily assimilable than English nitrogen? I believe that his first results were the natural consequences of a leak into his apparatus, somehow and somewhere, of combined nitrogen in some form; and I

am not the only one to hold this belief. Such leakage could easily occur unless great care were taken to guard against it; and some precautions that a trained chemist would naturally take might not be thought of by a trained watchmaker. I am assured, further, that the verdict of the committee of the Academy was secured through a fraud. This fraud consisted in the substitution, during the night previous to one of the latest visits of the committee, of more healthy and vigorous plants for the feeble ones which had grown in the case, and which showed by their appearance that they were suffering for want of some constituent of their natural food; and as they had been supplied with everything but combined nitrogen, it is reasonable to suppose that it was for want of this that they had suffered. The substituted plants, that had been put into the case that night, were the ones really analyzed, and used as evidence of the assimilability of free nitrogen. Dr. Pugh, who communicated this information to me, received it directly from one who saw the sickly plants in the case at night, and the healthy ones there the next morning. This piece of shameful history offers the only solution of what would otherwise be an inexplicable riddle.

Furthermore, I believe in these results that have been given us by Boussingault, and by Lawes, Gilbert, and Pugh, because they are reasonable. They are in full accord with what we know of the chemical properties of nitrogen, and of the kind of food, other than nitrogenous, that the plant depends upon for sustenance.

Any who have studied chemistry at all know that there are two sharply distinct classes or substances dealt with in that science, namely, the elementary substances, and the chemical compounds; that the elements are bodies that we have not yet been able to break up into two or more different and distinct bodies; that a compound body is made up by the chemical union of two or more of these elements; that oxygen, nitrogen, gold, silver, iron, etc., are elements; and that water, ammonia, phosphoric acid, lime, etc., are compound bodies. Now the plant is made up entirely of compound substances—and, leaving for the moment its nitrogenous food out of consideration, with respect to all its other food it is absolutely certain that it feeds only on compound bodies or chemical compounds; this is one good reason why we should expect that it would not feed on the element, nitrogen, but on some of the various compounds of nitrogen which we know by experience

to be excellent plant food. Another good reason is that, of all the elements, nitrogen is the one most unwillingly forced into chemical combination; there is not another element of common occurrence that is so well satisfied to remain alone by itself as nitrogen is. Very powerful chemical persuasion has to be brought to bear upon it, to get it out of its state of isolation; never was the most confirmed old bachelor more obstinate in maintaining his bachelorhood. It would be singular, indeed, if the plant, while feeding as to everything else on chemical compounds only, should have the heavy work put upon it of forcing unwilling nitrogen into combination. It is evident enough from all our experience that it does not do that work if it can get nitrogen elsewhere—and there is not a particle of reliable proof that it does that work under any circumstances whatever.

Other chemists in France have investigated this question on a small scale, but with contradictory results. There is not time to speak further of their work. But I must give a brief account of the experiments made by Professor Atwater, of Connecticut, within the past three or four years. These were made with peas, grown in sand which had been completely freed from plant food by washing and strong heating, after which it could contain no nitrogen. The plants were fed with solutions applied to the sand, containing known quantities of all the nutrients required, including a certain amount of nitrogen compounds. They were left in the open air, except when necessary to put them under shelter to prevent them from getting any unknown quantities of nitrogen compounds from rain or dew. In all but one out of fifteen such experiments, carried on in two successive years, there was a gain of nitrogen over and above what was supplied in the seed and food. This gain was in two cases fully equal to all that the plants took from the nutritive solutions with which they were fed, and the plants, according to the observations of the experimenter, seemed the better able to make these gains, the more the conditions of their nourishment, as to the quantity and kind of food supplied, were like those of ordinary growth in the field. On the basis of his results, Prof. Atwater estimated that an acre of peas, fairly well fed, might gather in, from some source other than the food supplied in the soil, from 70 to 120 pounds of nitrogen. It would require over 700 pounds of nitrate of soda, costing about $19, to supply 120 pounds of nitrogen.

The conditions of Prof. Atwater's experiments were such that there would seem to be no source from which this nitrogen could have been derived other than the atmosphere. But still he does not venture to claim for his results that they necessarily give support to the doctrine that *free* nitrogen is assimilable. We are, then, naturally led to consider the atmosphere as a source of *combined* nitrogen. There is always a minute quantity of ammonia there, in a gaseous form, and a minute quantity of nitrate. According to the theory of an eminent French agricultural chemist, the millions of pounds of nitrates carried into the sea every year by all the great rivers, which is almost entirely the product of the wastage of the human and other animal inhabitants of the land—are converted, through the agency of the vegetable and animal life of the sea, into ammonia. This is given off into the air above the water, and wafted by the winds over the land. Thus, if this not unreasonable theory be true, there is provision for the constant replenishment of the supply of combined nitrogen in the atmosphere.

Although the quantity appears to be small — only one part in 530,000 parts of air—yet in the layer of air, four miles high, over each acre of land there are about 140 pounds of this plant food, very precious to the crops if they can get hold of it. When we consider that the air is in constant motion, not only in horizontal directions but also upwards and downwards, it is not difficult to understand how a large portion of this ammonia may be brought in contact with vegetation and the soil, during the growing season. But, when it comes within reach, how can vegetation take possession of it?

First. To some extent — no one can say how much — through the foliage. It has been proven by experiment that a plant can supply itself with nitrogen in this way, if its leaves are exposed to air containing ammonia gas. It is very natural that clover, with its great abundance of foliage, should be supposed to have the power to help itself to nitrogen compounds from the air more liberally than wheat with its much smaller leaf surface; and this view appears to be supported by the well known fact that clover is a good crop to come before wheat, which needs nitrogen in the soil. But such very few experiments as have been performed, to test this supposed special feeding power of clover on nitrogen compounds in the air, do not support this view; and the beneficial effect of clover preceding wheat can be accounted for, at least to a

large extent, in another way. Those who so strongly insist that clover feeds upon the air forget that in every arable soil, such as clover is usually raised in, there are many hundreds and often some thousands of pounds of nitrogen in chemical combination, although in forms not readily assimilable. But, for all that, it may not be denied that, with the breezes almost constantly bringing fresh portions of air in contact with the foliage, at least a little and perhaps more than a little of their nitrogen may be gained in this way. But it should be noticed in this connection that many of Boussingault's first trials were made under very much the same conditions as those fixed by Prof. Atwater. In nearly all cases there were slight gains of nitrogen when the plants were grown with exposure to free air; but they were very small, falling very far short of those made by Prof. Atwater's plants.

But this ammonia of the air can also reach the plant by way of the roots, through the power possessed by the soil of absorbing gases within its pores. That such absorption of ammonia does take place has been proven by experiment. It is an operation that may go on all the time, day and night alike, and during as much of the year as the soil is open to the access of the air. It cannot be told how much combined nitrogen may be brought within reach of the crops in this way, for it is about impracticable to determine with any degree of accuracy the rate of this absorption. Kœnig in Germany estimated it at about thirty pounds per acre and year; but in such a manner that his result was not after all much better than a pretty reliable guess. If the quantity is as large as this, however, it is a valuable contribution to the nitrogen supply.

Perhaps you are acquainted with the history of that rather remarkable system of culture, that was carried on for a dozen years or more by Rev. Mr. Smith, on the Lois Weedon farm in England —the results of which furnish such a striking illustration of what can be accomplished by tillage alone. The fields were divided off into strips three feet wide. In the first year of the course, every alternate one of these strips was planted with three rows of wheat, a foot apart; the spaces thus left between the rows being wide enough to permit full and complete culture by hand, during a large part of the growing season. The unoccupied three-foot strips were most thoroughly cultivated during the whole season; largely by hand labor. In the following year these unoccupied strips were in their turn planted with wheat, in rows a foot apart,

and the planted strips of the previous year were in their turn subjected to thorough tillage. Thus the system was continued for twelve years and without the use of a particle of manure. The results were somewhat astonishing. You will observe that on each acre of wheat only half was really occupied by the crop, in each year; while the other half, consisting of the three-foot vacant spaces, was being cultivated in preparation for the next year. But on each acre so treated—only half of it really bearing a crop, and that half in rows a foot apart—the yield was as great as on manured land prepared for and sown with wheat in the ordinary manner. The average crop per acre was 25 bushels; and in the eleventh year the yield amounted to 37 bushels, with 2 tons of straw.

Now experience and experiment go to show that wheat is, generally, especially thankful for a manuring containing nitrogen; on Mr. Lawes' experimental grounds any other constituent of manures could be spared better than the nitrogen; hence it is reasonable to infer that the extremely thorough and unceasing tillage of the soil at Lois Weedon, exposing as it did constantly a fresh and porous surface to the air, so facilitated this direct absorption of ammonia, or (as it may yet appear) of nitrogen in some other shape, from that great reservoir, as to make these large crops possible without the addition of any nitrogenous manure to the soil.

There is yet another way, already incidentally named, for nitrogen compounds in the air to reach the plant through the soil. Besides ammonia, there is always some nitrate in the air. Both compounds are very soluble in water, and consequently every rain will carry nitrogenous plant food to the soil. At several of the experiment stations in Prussia, the quantities of nitrogen thus brought within the reach of vegetation during the year were carefully determined; these quantities were found to be quite different in different places; the largest amount was 21 lbs. to the acre, and the smallest 2 lbs.; and it was also found that nitrogenous manures were most effective at that place where the natural supply of combined nitrogen was smallest. This is one observation going to show that these natural supplies have an appreciable value.

Various averages have been given for the quantity of combined nitrogen thus carried down to the soil in the course of the year. Where extremes may be so far apart, averages have to be taken

with a considerable margin; but we may perhaps allow that from ten to twelve pounds of nitrogen per acre will be provided for the crops or, rather, carried down to the soil every year; some of it, however, in the cold season when no crop is growing. An acre's crop of clover requires about 100 lbs. of nitrogen; of Indian corn, 80 lbs.; of timothy, 45 lbs.; of potatoes, 44 lbs. Therefore the supply in the rain is far from sufficient, even if all of it should come at the right time, and be at once taken up by vegetation; but such complete use of it is not at all probable.

So much for the nitrogen that the crops may possibly gather from compounds of nitrogen in the atmosphere. Now, while still affirming that the principle is well established that there is, in the living plant, no power to cause nitrogen to enter into chemical combination, it must be granted that there seem to be evidences of such a power working, in quiet and unobtrusive ways, outside of the plant, or quite independently of its vital activity. Two discoveries in this direction have been made by Berthelot, an eminent French chemist. He has shown, first, that through the electrical relations existing between the earth and the atmosphere, and especially in the presence of certain very common vegetable products, nitrogen is quietly persuaded into chemical combination. But we have not, as yet, the least idea how much or how little nitrogen is likely to be thus made available to vegetation. The importance of this discovery seems small in comparison with the later one, made known only last year. In this Berthelot found that free nitrogen is absorbed by clay—whether pure or mixed with sand—and is converted into some form of combination that is neither ammonia nor nitrate. When a pot of ordinary loam was exposed freely to the air, so that it might take possession of all the combined nitrogen that could reach it in the rain or dew, or by direct absorption of ammonia, it was found to contain considerably more nitrogen, taken up, by this newly discovered method, from the free nitrogen of the air, than was collected by all the other methods; the action of the clay appearing to be entirely independent of the combined nitrogen already existing in the air. It was found, further, that this absorption of free nitrogen was dependent upon the cöoperation of minute living organisms, called bacteria; for if the soil is previously sterilized, as it is called, by heating it up to the boiling point of water, when all such organisms are killed, and it is then exposed only to air filtered through cotton, through which no fresh

supply of these organisms can make their way, this absorption of nitrogen ceases.

This useful work of these organisms goes on most rapidly under just those conditions of the soil and air that are most favorable for vegetable growth; nitrogen is most rapidly absorbed in this way in summer, and the operation does not go on in winter. Berthelot estimated that at least from 25 to 30 pounds of nitrogen may be absorbed, in the season from April to October, by the soil of an acre. This seems to me to be one of the most curious and interesting discoveries that has been lately made in regard to this nitrogen question; and it is the more interesting when regarded in connection with the fact that another kind of bacteria work upon the insoluble and unassimilable nitrogen compounds in the soil; slowly converting them into nitrates, than which there is no better form of nitrogenous plant food. As friends or foes, these very minute beings stand in close relation to our comfort and happiness. From their apparent connection with many dangerous animal diseases, we have come to regard them much more as enemies than as friends; and since it is now quite clearly proven that they are the cause of the pear blight, and their baneful influence in connection with diseases of the vegetable kingdom is thus established, we have become still less kindly disposed towards them; but by the time that all the phases of their work shall have been clearly made out, we may find that its sum total shows a beneficial balance in our favor.

To sum up the whole matter — we find that there are five ways in which vegetation may get nitrogen more or less directly from the atmosphere: —

First. By means of the ammonia compounds and nitrates, already formed there, and which are conveyed to the foliage and to the soil by the fogs, dews, and rains, and to the soil by the snows of winter.

Second. By the direct absorption of gaseous ammonia compounds from the air by the foliage.

Third. By the absorption of gaseous ammonia compounds by the soil, in the same manner that any porous body will absorb any gas to which it is exposed.

Then follow the two ways which involve the direct conversion of free nitrogen into nitrogen compounds, *but not by the plant itself:*

Fourth. Through some electrical action, in the presence of pro-

ducts of vegetable growth; this may take place, possibly, in the very tissues of the plant itself.

Fifth. In ordinary arable soils, wherever the air penetrates them — and the more abundantly the freer the access of air, other conditions being favorable — by the help of a certain class of the living organisms called bacteria.

In some of Boussingault's earlier experiments, in all of his later ones, and in all of the experiments of Lawes, Gilbert, and Pugh, the plants were excluded from all of these sources of supply; these experiments simply proved that plants can make no use of the free nitrogen of the atmosphere through any power possessed by them of working it up into compounds containing nitrogen. Ville pretended to exclude his plants in his iron-framed glazed case from all these sources of nitrogen, also; but as they were somehow supplied with nitrogen compounds not mentioned in his account of his work, his experiments prove nothing.

Prof. Atwater's experimental plants were excluded from the first source of supply only, the ammonia and nitrate brought down by the rain; they had the full benefit of all the other sources, so far as free exposure to the air is concerned; but the soil that he used was simply sand charged with known quantities of plant food. As sand has little power of absorbing gases, he himself does not think that much nitrogen would become serviceable in that way; and as Berthelot's results, where the assistance of the bacteria came in, were obtained with soils containing clay, it remains yet to be determined whether these bacteria will do the same work in a sand. Finding little else to stand upon, in explanation of his results, Prof. Atwater refers them, at least in part, to the electrical action above mentioned; but further investigations must show whether so large gains could be made in this way alone. It seems to me very doubtful, and, for my own part, I must consider his results as not yet satisfactorily explained.

There is, I think, good and sufficient evidence, in this summing up of the several modes in which the crops may derive nitrogenous food from the atmosphere, and in my statement of the facts on which that summing up is based,—

First. That nitrogenous food can be obtained from that source, directly or indirectly, in considerable quantity, under favorable conditions.

And, *Second*, that there are possibilities of supply by some of

these methods of transfer of nitrogen from the air to the plant, whose limits have not yet been determined.

Therefore we can unhesitatingly admit that our crops may get a portion of their nitrogen from the air, as appears to be plainly shown by many experiments and much experience; and we can do this without being in the least degree forced to admit that plants can assimilate free nitrogen, and without being forced to cast a shadow of a doubt on the reliability of the researches of Boussingault and of Lawes, Gilbert, and Pugh — investigators to whom the science and the art of agriculture owe such a very large share of the progress that has been made in the last thirty years, and whose trustworthiness we cannot afford to call in question.

Discussion.

President Walcott expressed the thanks of the Society to Professor Caldwell, for the conclusive paper which he had read.

John B. Moore was called on and said he was glad that Professor Caldwell had demonstrated the correctness of the opinion which had been expressed here in previous years, that plants possess the power of in some way absorbing nitrogen from the air. He was surprised at the view of the lecturer, that M. Ville's experiments were not trustworthy; his book caused a great deal of thought and did good. He thought that others than chemists could perform such experiments as those of M. Ville, and that, with his own practical knowledge of cultivation, he could apply the results of experiments as well or better than chemists.

William H. Hunt said that he was in Paris when M. Ville was giving a course of lectures, and he attended one where the audience consisted of two persons besides himself, in a room that would accommodate three or four hundred persons. The courses were free, and the lectures on interesting subjects by good authorities were well attended.

President Walcott said that formerly monsters were considered the worst enemies of the human race, but now minute organisms are. But these germs have themselves so many enemies that it is difficult to cultivate them when wanted as subjects of study. The results of experiments of Professor Schlösing on the power of bacteria to produce nitrification agree with those of Berthelot, quoted by Professor Caldwell. It was shown that the function is

possessed by some soils more than others, and that plants have no power to do it without the assistance of bacteria.

Mr. Moore said that for the last two or three years we had heard much of bacteria destroying plants, and he was glad to know that they produced some benefit to the soil.

Professor Caldwell said that pear blight was the first instance where bacteria have been connected with vegetable disease.

Hon. Marshall P. Wilder referred to an article in the "Proceedings of the Twentieth Session of the American Pomological Society," by Professor J. C. Arthur, in which he gives an account of some experiments, going to show that pear blight is caused by bacteria, and said that it might all be true. We had been taught, and it seemed to him very probable, that nitrogen is very dormant and ineffective until brought into contact with other substances. We have long known the effect of ammonia on plants when it has been washed down out of the air by a shower, and this is more forcibly demonstrated in the greenhouse, by syringing the plants with a weak solution of ammonia. The proper administration of heat, light, air, and water are the most important points in the cultivation of plants. He was amazed to see how the professors differed in the results of their experiments in regard to nitrogen, and it looked to him quite probable that these differences were due to fraud.

Professor Caldwell said that the subject of his paper today was suggested by a remark, made by Mr. Moore, when he (Prof. C.) read a paper on a kindred subject here last year, that plants get their nitrogen in some way from the air. The subject announced for today was a much broader one; he had shown in his previous paper only what plants must get from the air; he intended now to show that in every arable soil there is an immense supply of nitrogen. The entire results of experiments on this subject must be based on trustworthy chemical analysis, and he wanted to show how the contradiction occurred; it was entirely impossible to obtain such results as those of M. Ville by fair means. Lawes and Gilbert would not have repeated their experiments, if it had not been necessary to demonstrate the incorrectness of M. Ville's statements.

President Walcott said that nitrogen is the "mugwump" among gases. It stands around without much to do generally, but when a great occasion arises it comes in, yet it cannot be depended on for a permanent alliance.

The Chairman of the Committee on Publication stated that John B. Moore, who had been announced to speak on the "Growth of Plants" on the next Saturday, would be unable to do so, and that an opportunity would be afforded to discuss such subjects as might be brought up at that time.

BUSINESS MEETING.

SATURDAY, April 3, 1886.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

Edward L. Beard said that the Rose and Strawberry Show would be the next great exhibition of the Society, and spoke of the Challenge and other Vases, which had been offered as Special Prizes for Roses at previous exhibitions, and had excited greater interest than the Society's prizes. The money for these prizes had been raised by private subscription, but he thought the time had come when the Society could afford to pay them from its own funds. The results of the Spring Exhibition were most flattering, and, as he did not wish the Society to take a retrograde step, he moved that the Executive Committee consider the expediency of making an appropriation for Special Prizes for Roses at the Rose Show in June, on the basis of the list of Special Subscription Prizes offered last year. The motion was carried.

The following named persons, having been recommended by the Executive Committee, were on ballot duly elected members of the Society:

CLEMENT M. HAMMOND, of Hyde Park.
CHARLES G. WOOD, of Boston.
DR. HOSEA M. QUIMBY, of Worcester.

Adjourned to Saturday, April 10.

MEETING FOR DISCUSSION.

THE NOMENCLATURE OF FRUITS.

Hon. Marshall P. Wilder said that the object of the reform in the names of fruits, which the American Pomological Society is en-

deavoring to effect, is the suppression from the catalogues throughout our country of all long, improper, indelicate, irrelevant, ostentatious, and superfluous titles, and to prevent any such appellations being hereafter applied to some of the most beautiful objects which the earth has ever brought forth.

They desire to suppress all royal titles such as Emperor, King, or Prince; all political titles such as President, or Governor; all military titles such as General, Colonel, or Captain; all indelicate names like Hog-pen, Sheep-nose, or Big Bob; all ostentatious names such as Excelsior, Ne Plus Ultra, and Stump the World; and all long names, of which Doyenne Gris d'Hiver Nouveau and Vingt-cinquième Anniversaire de Leopold I. are instances. They desire also to strike off the hundreds of Beurres and Doyennes from the names of our pears, where it is possible to do so, and hereafter to write simply Anjou, Diel, and Boussock in place of Beurre d'Anjou, Beurre Diel, and Doyenne Boussock. There are however some instances, such as the old Beurre Gris, Doyenne Blanc, and Doyenne Gris, where the Beurre and Doyenne must be retained, because the varieties bearing them are the original types of certain classes. Fortunately very few of the many pears originated in this country have the term Beurre prefixed—he did not think of more than one; and did not recollect that Doyenne has ever been applied to an American fruit. The term Beurre (butter) was originally applied to a pear of buttery texture, to distinguish it from one with breaking flesh; but as all the latter class have now gone out of cultivation (except a few varieties used only for cooking) it has lost its significance, and the sooner it is dropped the better. Doyenne, Bon Chretien, and Calebasse were names designating classes of pears, with reference to form as the chief distinguishing mark; but these have never been adopted in naming our American pears. The Massachusetts Horticultural Society about forty years ago established a classification of the forms of pears, of which the circle was the basis, and from this were deduced, as modifications, the compound forms—ovate, obovate, pyriform—obtuse, acute, and ovate pyriform, etc. This classification has been adopted by Downing, Thomas, Barry, and other leading authors in their works on fruits; indeed, no one who pretends to be a pomologist will undertake to describe pears without reference to this classification.

It is desirable that names of fruits should consist of one word

only, having a meaning somewhat appropriate to the variety; but sometimes we meet with obstacles to the application of this principle, as in the case of the Clapp's Favorite pear, there being also a Frederick Clapp and a Lemuel Clapp. So, also, we cannot omit the word Winter from Winter Nelis, because there is an Autumn Nelis and a Barbe Nelis; and other instances might be given. Among apples we have several Spitzenbergs, Russets, etc., words which should be dispensed with as far as possible, but we cannot always drop them. Again, the terms "Beauty" and "Choice," as well as "Favorite," not being distinctive appellations, are in most instances better dispensed with. There are many other terms which are senseless and useless, such as Seedling and Pippin (the latter of the same signification as the former, but applied only to apples); for all varieties of fruits are originally seedlings. Those renowned fruits—the Baldwin apple, the Bartlett pear, and the Concord grape—afford examples of short, appropriate, sensible, and easily remembered names, and it is to be hoped that in the future many such varieties may be added to those we already possess, and be dedicated to perpetual remembrance by equally appropriate names. In a word, we desire to establish a system of nomenclature which shall be pure and plain in its diction, pertinent and proper in its application, and which shall be an example, not only to our own, but to other countries.

H. Weld Fuller said that all would approve the remarks of Ex-President Wilder in regard to improper or irrelevant names. It is desirable that all names of fruits should have reference to locality, quality, or other characteristics.

O. B. Hadwen said that those who originate new fruits worthy of cultivation, instead of giving them local names, should bring them before a horticultural society and have names bestowed by a competent committee, and then they would go out with proper authority. An excellent apple which originated in Worcester County was called the Hog-pen, because the original tree sprang up near a hog-pen; and this is the way such names creep in; but in this case the name was changed by the Worcester County Horticultural Society to Holden Pippin, which all must admit to be a great improvement. The subject is a very important one, and not only apples and pears, but all fruits, large and small, and also ornamental trees, plants, and flowers should be named by horticultural societies after careful consideration.

Colonel Henry W. Wilson spoke of the difficulty experienced by those unacquainted with the French language, in pronouncing the many French names of pears and other fruits, such as Glout Morceau, Duchesse d'Angouleme, and Louise Bonne of Jersey; and the last two are also objectionable on account of their length. When the Clapp's Favorite pear was introduced it was proposed to name it the Wilder. Such names as Stump-the-World are not a credit to those engaged in the cultivation of fruit, and intelligent persons when they hear them ask why they are used.

Mr. Wilder said, in reference to the Clapp's Favorite pear, that when it was introduced the Massachusetts Agricultural Club desired to possess the control of the variety, and give to it his name; but Thaddeus Clapp, who originated it, preferred to have it dedicated to the family name, and a figure of the pear is carved on his monument in Forest Hills Cemetery.

E. W. Wood, Chairman of the Fruit Committee, said that the Committee were very glad to adopt the change in the nomenclature of fruits on account of the saving of labor to them by the shortening of names. Last autumn he visited the fair of the Housatonic Valley Agricultural Society, where there was the best exhibition of apples he saw during the whole season, but many of the apples, and a majority of the pears, were wrongly named. There was no requirement that a dish of fruit must be rightly named to receive a premium. The case was the same at Natick, but at this year's exhibition there it will be required that all fruits shall be correctly named, or they cannot receive prizes. Persons who visit the exhibitions of our Society are becoming more familiar with the names of fruits. "A rose by any other name would smell as sweet," but the speaker did not see how fruits could be intelligently cultivated under wrong names. The multiplicity of names by which our fruits are known is sometimes perplexing; the Baldwin apple has seven synonymes, and Downing describes one variety which has no less than forty. In reading the reports of the exhibitions of fruits, sometimes, owing to the multitude of synonymes, we do not know what we are reading about; and therefore we want uniformity in names. There are seventy varieties of plums, of which the word "Gage" forms part of the name; the originator of each hoped to get glory by using the name of Gage. Sometimes there may be a necessity for more than one word in a name. The speaker approved Mr. Hadwen's suggestion

that new productions should be named by horticultural societies; people claim the same right to name a fruit as to name a child, but if the suggestion could be adopted it would be of great benefit. The reform in nomenclature originated in the right place, the National Society, which will continue to revise the names of fruits.

Mr. Wilder said that the American Pomological Society claims and exercises the right to change improper names.

Rev. A. B. Muzzey said that from his long connection with our Society, which probably began earlier than that of any other person in the room except Mr. Wilder, he felt the deepest interest in it. Fifty years ago he began to cultivate fruit, and attached what many persons thought unnecessary importance to the correctness of the names. Cultivators should consult and compare their fruits, so as to be sure of their correct names. We might begin now and here, by the appointment of a committee on this subject. Mr. Muzzey spoke of the influence of the ladies in the completion of Bunker Hill Monument, which had remained a long time unfinished, and a source of mortification, until the ladies took hold of the work in a manner that led Judge Story to say, "The monument is built!" So here, in its lady members, this Society has the strongest part of humanity, and the time will come when the ladies will not feel so diffident in speaking as they do now.

Edward L. Beard thought it would be well for the Society to consider the best method of extending the interest in horticulture beyond the sphere in which its influence has thus far been exercised, and to points where there is at present much ignorance of horticulture and a great deficiency of horticultural taste. It would be exceedingly desirable to organize some broader system of encouraging, through local societies, a general improvement of all the productions of the soil. By this means we might get results which would be a great blessing to dwellers in our smaller towns. The question is how best to encourage the enterprise of local horticultural societies. The horticultural societies in Worcester, Springfield, Newton, and other places have effected much good, and similar societies should be formed wherever possible. The people who come to our exhibitions see what are the best fruits and flowers, and admire them, but only a few have knowledge of how they are produced; and we are bound, as the leading horticultural society of the country, to supply the

want as far as we can. We may go on exhibiting, but until we teach people how to produce the fruits and flowers and vegetables here displayed, we have failed of the greatest results.

John G. Barker expressed his approval of what Mr. Beard had said. As instancing the need of information, he said that he saw at the excellent agricultural exhibition at Ashby, last autumn, Clapp's Favorite pears, marked Pound! At the exhibition of the Houghton Horticultural Society at Lynn, begonias were marked bignonias; and other plants had equally incorrect names affixed. Cultivators have catalogues from which they might obtain the correct names, but they will not take the trouble. He suggested that this society might send delegates to the local societies, who should note such errors as he had mentioned, and impart the information needed for the correct naming of the productions exhibited. As superintendent of Pine Grove Cemetery at Lynn, he was glad to give information to all who visit it; but he had not thought it proper to label plants there. He thought that the information acquired at the cemetery in regard to plants, shrubs, and trees had had a marked influence on those who had laid out grounds since he had been superintendent, and that, if those who have the care of public grounds would take the time and pains to give information to persons asking it, it would have a good influence.

Mr. Hadwen said that he could recollect very well the first exhibition of the Worcester County Horticultural Society in 1840; at which there were very few fruits correctly named. He also remembered when the only flowers generally seen were a few varieties of roses in June, and the tiger lily in autumn, but now he sees a great variety of flowers, and the growers can generally tell their names. Ladies have set as good an example as men in growing flowers, both here and at Worcester. Men have given their time to their farms, and consequently have been obliged to leave the cultivation of flowers largely to their wives. He sometimes brings home what he supposes to be a new plant, and Mrs. Hadwen tells him her mother had the same thing fifty years ago.

Mr. Wilder said that we are very much indebted to ladies for the improvement apparent in the cultivation of flowers. He spoke of the time, very early in the history of this Society, when it was proposed to elect Mrs. Gore, wife of the Governor of this State, and Mrs. Griffith, of New Jersey, honorary members, but some thought the proposition of doubtful expediency, because a woman

made trouble in the garden of Eden. As we go on in refinement, we shall not only have ladies at our side, but shall have more and more aid from them in the training of flowers.

Edmund Hersey said that the Hingham Horticultural Society holds meetings for discussion every month, summer and winter. The influence of the Massachusetts Horticultural Society reaches to Hingham. They have learned from it how to arrange the plants at their annual exhibitions; and he believes they have things as well arranged as any society except this. He suggested that we might follow the method of the Massachusetts Society for Promoting Agriculture, which as early as 1813 sent out circulars urging the formation of local societies. One existed in Hingham from 1814 to 1830, which may have afforded the suggestion of forming the present one. He advised that some means be used to secure the formation of local horticultural societies; wherever such a society is formed we shall have the strongest men coöperating with us.

Joseph H. Woodford called attention to the fine display of flowers on the table, among which were a large collection of camellias from C. M. Hovey, including his new seedling, Florence Hovey; *Rhododendron Veitchianum lævigatum* and other beautiful greenhouse rhododendrons from Mrs. Francis B. Hayes; a fine seedling Amaryllis from Mrs. E. M. Gill, and beautiful orchids from Robert Blair and F. L. Ames. Mr. Woodford added that village improvement societies are probably the strongest agents for beautifying towns. There is always local talent that can be utilized.

Henry Ross agreed with all that had been said in favor of local societies. The Newton Horticultural Society has exerted a beneficial influence, not alone for the present, but for all time; it will be seen more in the next generation than now. It has done a good work in the encouragement it has given to the cultivation of flowers in school grounds.

President Walcott said that the whole question how best to advance horticulture is a significant one, and everything the society can do for its advancement in a wider field should be done. Local improvement societies meet the want in a great measure. While a member of the State Board of Health, Lunacy, and Charity, he was struck with the view taken by the superintendents of the great State institutions, of the influence of flowers and their cultivation on the inmates. At Tewksbury, the great dumping ground for

the refuse of humanity—brought there not by misfortune alone—Mr. Marsh, the superintendent, found the influence of flowers most beneficial; and the superintendent of the Hospital for the Insane at Worcester, and others, would acknowledge the aid derived from flowers.

The Chairman of the Committee on Discussions announced that on the next Saturday Hon. Marshall P. Wilder would read a paper on the "Ripening and Preservation of Fruit."

BUSINESS MEETING.

SATURDAY, April 10, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, Vice President BENJAMIN G. SMITH in the chair.

No business being brought before the meeting, it adjourned to Saturday, May 1.

MEETING FOR DISCUSSION.

THE RIPENING AND PRESERVATION OF FRUITS.

By HON. MARSHALL P. WILDER, Dorchester.

Mr. President: — In compliance with the request of Mr. Hadwen, Chairman of the Committee on Discussion, I have consented to address this meeting on the Ripening and Preservation of Fruits.

So much has been written and said on this subject that I cannot expect to offer much, except in confirmation of what I have uttered in former addresses.

The principles upon which success must ever depend are now so well established that it is only necessary to bring them to mind for our government. The preservation of apples through the winter months is now pretty well understood, but with the pear, grape, and other delicate fruits more care is requisite.

The ripening of fruit depends on the saccharine fermentation; this is followed by the vinous and acetous fermentations. To prevent

these, and preserve fruit in all its beauty, freshness, and flavor, the temperature must be uniform, and kept below the degree at which the fermentation or ripening process commences. Mr. Robert Manning, in a prize essay, said—"The ripening of fruit is the completion of the chemical process by which starch is transformed into sugar, and is the first step toward fermentation or decay; therefore, whatever promotes fermentation will hasten the ripening; whatever retards fermentation will tend to its preservation."

Late fruits may remain on the trees until severe frosts are feared, but should be gathered with great care. Summer pears should be picked some days before the ripening process commences. A summer pear ripened upon the tree is generally inferior. In respect to the latter Mr. Patrick Barry has so aptly expressed my own opinion that I use his language: "The process of ripening on the tree, which is the natural one, seems to act upon the fruit for the benefit of the seed; as it tends to the formation of woody fibre and farina. When the fruit is removed from the tree at the commencement of ripening, and placed in a still atmosphere, the natural process seems to be counteracted, and sugar and juice are elaborated instead of fibre and farina." Thus pears which become mealy and rot at the core if left on the tree to ripen, are juicy, melting, and delicious when ripened in the house.

With the increase of fruits their preservation in the most perfect condition has become a matter of great importance; various methods have been adopted, both in this and other countries, for this purpose, many of which have been failures. Nearly half a century ago the first houses of which I have any knowledge were built for the preservation of fruits by the retardation of their ripening. Most of these were controlled by ice; others by the use of chemicals and apparatus with revolving fans to diffuse the cool air through the various rooms.

About twenty years ago several patents were secured for the preservation and long-keeping of fruits and other commodities by Messrs. Shaler, Nyce, and Smith. Professor Nyce of Ohio had one of his houses built in Boston, to be controlled by ice, and many constructed upon his plan are still in use in our large cities and towns for the preservation of meats as well as fruits.

Mr. Nathan Hellings, of Pennsylvania, also informs us of the

method he pursued in 1868 in building a house for the preservation of fruit, which proved very successful. He used no chemicals or machinery, but regulated the temperature of the house by the use of ice, and was able to keep it at from 34° to 36°. The atmosphere was so cool and dry that no moisture was deposited on the walls, and there was no dripping from the ceiling. The most constant attention was given to the ventilation; and light was entirely excluded, to prevent ripening and shrivelling. With these arrangements so perfected, no gases or mixtures of gases with atmospheric air were ever generated. His fruit, when brought out, retained its primitive freshness and health for a longer time than that we usually have from modern storehouses, and in these houses he kept apples two or three years in perfect condition. His houses are still in successful operation near Bristol, Pa.

But the most common method for small establishments and private use is the construction of houses with walls of non-conducting materials, and with well drained and thoroughly cemented cellars. Such was the house built by M. Victor Paquet of Paris about forty years ago—which he managed without the use of ice or chemicals—an account of which was given in the illustrated TRANSACTIONS of this Society in 1847. The house was built with outer and inner walls, having a space of three feet between; it was in fact a house within a house, and so arranged that the temperature could be controlled at will; it was kept at a little below 40° Fahrenheit. Our climate differs so much from that of Paris that we cannot follow all of M. Paquet's plans. Suffice it to say that by this process, without the use of ice, he kept his fruits in perfect condition until June.

On this plan, fruit houses may be constructed at a very moderate expense, in which fruits may be kept in all their beauty, freshness, and flavor through the entire season. The Anjou pear was exhibited before this Society as late as the month of May, by the late Mr. Gardner Brewer, from his retarding house.

Mr. Charles F. Curtis, one of the fruit merchants of this city, informs me that there is no decided preference between a cold storage house controlled by chemicals and one where ice is used. Each has its advocates.

The fruit house of Ellwanger & Barry, at Rochester, N. Y., is a building whose walls and floor are lined with straw and boards, with cellars underneath for storing fruit. When the mercury goes

ten or twelve degrees below zero, a few degrees — three or four — of frost get in, but the boxes and barrels are all covered with straw mats and are never reached by the frost.

When the late fall and winter pears are gathered they are put in bushel or half-bushel boxes, and placed on the north side of a building, outside of the fruit house and protected. They are kept there as long as the weather will permit; by that time the room has got thoroughly cooled and ready to receive the fruit. They have both pears and apples there now in perfection.

In the report of the Michigan Horticultural Society for 1882 is an account, by Mr. S. W. Dorr, of a fruit house constructed by him, on the cold air system, without the use of ice. He lays down the principle that, in order to keep fruit for any great length of time, the store-room must be frost-proof and kept at a low, even temperature — three or four degrees above freezing — with sufficient ventilation to carry off all moisture and impurities. He was able to keep his house within three degrees of freezing for five months; and when the temperature outside changed sixty degrees in twenty-four hours, the change in the fruit room was imperceptible. Again, when the thermometer fell to points varying from six to twenty degrees below zero, five days in succession, the temperature scarcely changed one degree in the fruit house. This result was effected by building a house with triple walls, fifteen inches in thickness, ten inches of which was filled with sawdust.

One chief condition of success consists in the state in which the fruit goes to the cooler. It should be taken before any sound specimen begins to show ripeness, and no single fruit should be stored that has fallen to the ground; for, however perfect it may seem, sooner or later that dropped fruit will make its presence known, and will often cause the decay of the whole package unless noticed in time; which rarely happens when hundreds of bushels are piled one above another for a month or two. The fruits intended for cold storage houses should go directly from the orchard. The cause of so many failures—in storing pears, for instance—is that the fruit is often bought of different parties, much of it imperfectly packed, and coming to hand in no condition to go to the cooler; perhaps it has been gathered weeks previously, or carried long distances and become more or less bruised, and rendered in all respects unfit for keeping in this way. The past fall hundreds of bushels of Bartlett pears that were nearly ripe were stored by small fruit venders who knew nothing about the subject.

The after conditions of success may be briefly stated as follows: *The perfect control of temperature, light, and moisture*; all experience shows that, without such control, success cannot be attained. Storage apartments must be dark, dry, uniformly and moderately cool, and constructed so as to exclude at pleasure the variable external atmosphere. Apples may be kept at a lower temperature than pears — say thirty-four to forty degrees.

After many years of experience, both with and without ice, I have adopted a house built in a cool, shady aspect, with the door on the north; and with a thoroughly drained and cemented cellar, having small double windows which may be opened or closed at pleasure. In this way I am enabled to keep my late fall and winter pears until February or March in good condition. Mr. John J. Thomas writes me that in a fruit room of this kind, by admitting air on cold nights, and closing the entrances when the air is warm, he has had sound Lawrence pears in March, and Josephine of Malines in April, and Baldwin apples in June.

My late fall and winter fruits, intended for long keeping, are allowed to remain on the trees until frost is apprehended. They are then gathered with great care into bushel boxes, and placed in tiers of boxes six or seven feet high, and covered with boards, on the north side of my fruit house, where they are kept until the ground begins to freeze. They are then removed to the cellar, and there piled up in the same manner, with thin strips of boards or shingles between the boxes, until wanted for use; when the boxes are looked over and the most mature are from time to time taken out. In this way I keep pears until March or April in perfect condition.

In regard to the use of ice, I would say that where fruits are kept for some months under its influence at a very low temperature, they seem to lose much of their flavor; the cellular tissue also seems to have become dry and to have lost its vitality, or power to resume the ripening process. Experience proves that, for the common varieties of the pear, about forty degrees of Fahrenheit is the temperature best suited to hold this process in equilibrium. The proper maturing of fruit thus preserved demands skill and science. Different varieties require different degrees of moisture and heat, according to the firmness of the skin and the texture of the flesh. Thus some varieties of the pear will ripen at a low temperature and in a comparatively dry atmosphere, while others are

improved by a warm and humid air. Some varieties of the pear, ripening with difficulty and formerly esteemed only second rate, are now pronounced of excellent quality because the art of maturing them is better understood. Great improvement has been made in the handling, packing, and preservation of fruits, so that they are delivered in perfect condition from distant places, every class of fruit having its suitable style of package. So well is the art of keeping grapes now understood that we have them in our markets, in such fine order as to command from fifteen to twenty cents per pound, until the month of May.

Discussion.

H. Weld Fuller said that there was considerable range of temperature in the houses mentioned; the essayist had advised forty degrees for pears, but he would like to hear something further in regard to temperature.

Mr. Wilder replied that his remarks referred principally to pears, and more especially some varieties which, ripening early, are more delicate than others, and will not bear so low a temperature. The Bartlett pear may easily be kept for a long time in a cold house, but it loses its flavor after being exposed to a low temperature for two weeks. It is very important that the temperature should be uniform, and so low as to prevent fermentation. He once had a house controlled by ice, and found that forty degrees would hold fermentation in check. His cellar sometimes gets below freezing and then he covers with mats, as Ellwanger & Barry do. In reply to a question whether the important point is not that the temperature, whatever it is, must be uniform, he said that it is, but it must be kept within certain limits — not too high or too low.

David B. Flint said that he once had a crop of very fine Easter Beurre pears which were frozen hard on the tree, but he sprinkled them with water so as to thaw them slowly, after which they hung on the tree for two weeks. They were then wrapped in paper and packed carefully in a box and put on a table in the cellar, and on Christmas Day he went to New York and shut up the house, and the pears were not looked at until he came back on the 9th of May, when he expected to find them rotten, but they were in perfect condition and finely ripened; and he distributed them among

friends and physicians, for sick persons. He thought they must have been frozen while in the cellar, for it was half out of ground and had only an eight-inch wall, with a window of single glass near the pears. His partner once put a bushel box of pears into an out-house and forgot them until spring, when they were taken out in perfect condition.

William H. Hills of Plaistow, N. H., said there are many things about the keeping of fruit that are difficult to explain. He supposed that keeping a uniform temperature would preserve fruit. Last fall the New Hampshire Agricultural Society offered premiums for Early Bough apples, and he wrapped his in paper and packed them in jars in gypsum to keep them until the exhibition. Some that he left in his office, which was warmed by a stove, kept to December and then dried up, while those which he took to the fair kept four days with difficulty. He did not understand how apples kept on the ground, when they would freeze on a shelf. He has kept apples sound in tight barrels while those in more open casks decayed. He has built a dry cellar, where the thermometer sometimes falls to twenty-eight degrees, and then if more warmth is desired, he puts in a lighted lamp, which raises it to thirty-two degrees or more, and here apples keep exceedingly well though the thermometer is as low as twenty-seven or twenty-eight degrees half the time. There has been much discussion as to whether apples should be kept dry or damp. He knew an instance where water got into a cellar, yet the apples kept well.

Mr. Wilder said that the preservation of apples on the ground arises from the moisture in the ground extracting the frost; as syringing plants, when frozen in the greenhouse, thaws them without injury. He had aimed, in his paper, to show how cheaply a fruit house can be made, and how fruit can be kept with a little care.

Mr. Hills thought that freezing apples once might not injure them, but repeated freezing and thawing would, and handling while frozen would injure them.

O. B. Hadwen said that it is one thing to cultivate apples and another to preserve them. We are fortunate in living in a section where fruits do not all ripen at one time; especially the large fruits, such as the apple and pear, which extend over a long period. As Mr. Wilder had said, uniformly cool temperature is the important point; if irregular, the ripening is a matter of uncertainty.

It is not desirable to preserve fruits at the expense of losing their flavor. Housekeepers take fruits when in their best condition, and put them up in glass jars, and the flavor is preserved; it is easily done, and they are always ready for use. The Gravenstein and Palmer apples are unrivalled in quality and can be kept in perfection; pears also may be kept perfectly. He thought, as a rule, if we extend the keeping of fruits, we extend the price.

Robert Manning thought that the most critical time in regard to keeping fruit is the warm days in autumn — the lovely Indian Summer days of October. Especial care is then needed to carry them past this time. They should be piled up on the north side of a building, or if kept inside the doors should be open during the night and closed by day. Last October was uncommonly warm, and therefore unusually difficult to keep fruit through.

Mr. Wilder said, in answer to an inquiry, that everything depends on the condition of fruit when it is placed in the storehouse. His superintendent watches the picking of his fruit with the greatest care; every fruit is handled as carefully as an egg. The dealers in Boston who buy pears in the market to keep in the cool houses often suffer loss from the careless way in which the fruit has been handled. Fruit placed in the storehouse bruised and in uneven condition as to ripeness will never keep.

Mr. Hadwen said that fruit designed to be kept should be picked before it is too ripe. He had kept green Boussock pears for four weeks. It is especially desirable in gathering winter apples, such as Baldwins or Greenings, which are wanted to keep late, that they should not be too ripe.

The Chairman, Benjamin G. Smith, said that shippers begin gathering apples two or three weeks before it is generally done.

E. W. Wood agreed with Mr. Manning that the time of warm autumn weather is a critical one in the keeping of fruit. He generally picks his Anjou pears about the tenth of October, and last year they ripened about the end of that month and he had to send them to market. Every year apples are found under leaves, perfectly sound, in the spring. He thought those who store apples like to have the temperature as low as 30° and from that to 28°. Every year they get caught and frozen, but this is not considered an injury if the fruit is not wanted for immediate use. His father had stored apples in the cellar and found them frozen, but he allowed them to thaw without moving and they came out in per-

fect condition. They must not be shaken while frozen. People ask why fruit does not keep as well as it used to, but they are thinking of old-time cellars in the country, where there were no furnaces, and the cellars had to be banked up to keep out the frost. He thought the opinion of dealers is that houses where ice is used are apt to be damp from the waste of the ice, and that consequently the flavor is not as good and the fruit does not keep as well as where chemicals are used. In the cold storage house on North street, which is five stories high and a hundred and fifty feet deep, with an engine in the attic, and kept cool by the use of chemicals, it is so dry that matches laid anywhere will light with perfect ease, and he was under the impression that fruit comes out of such a house with better flavor than from an ice house. Cold storage is a great convenience to fruit growers; Bartlett or other pears can be stored when there is a surplus, and put on the market as it will bear them, thus producing a very beneficial effect by equalizing prices and preventing the gluts that were so common formerly. The Vicar is the only kind that was carried through to the first of February this year.

Mr. Hills said that fruit from different soils will vary in keeping; he watches his fruit and picks that of trees on warm soils first; if he followed the opposite course, those on warm soils would be all on the ground before he got to them.

Joseph H. Woodford said that all depends on the time of picking; if fruit is left on the tree till fully ripe it will not keep. The sooner a pear is picked, after it attains its full size, the better. He was lately in Central America, and when he went to buy some bananas to bring home the dealers asked him whether he wanted full ripe, or two-thirds, or three-quarters. They said full ripe fruit would not keep but two days, while two-thirds ripe would keep till he got home; and it did, but did not have the flavor of fully grown. The interruption of the ripening process is what keeps fruit, but the temperature must be uniform after this interruption.

Mr. Flint said that he once kept nine or ten barrels of apples on the trees till the 9th of November, when his neighbors thought they were spoiled, but he piled the barrels up on the north side of a building until Christmas, and then put them in the stable and covered with straw, and they kept finely till April.

Mr. Wood said that Mr. Flint's apples probably kept cool on the tree. He once picked some Roxbury Russet apples very

carefully and left them in piles on the ground until they were covered with a foot of snow; they were afterwards packed in barrels in coal ashes and opened the middle of June, when they were very nearly perfect—plump, with the flesh crisp and juicy, and of fine flavor when others had lost their flavor. The air was excluded from them and the temperature was even. Fruit rooms in dwelling houses, even though separated from the furnace cellar, do not compare with farmers' cellars for keeping fruit.

Mr. Wilder said that the last season was one of the worst he had known for keeping fruit. The opinion that fruit, when kept in houses where cold is produced by chemicals, comes out with better flavor than that kept in ice houses may be correct, but there is difference of opinion on that point.

Referring to this being the last of the series of meetings for discussion, Mr. Wilder said that he could not allow the occasion to pass without expressing the great interest he felt in these discussions, and the pleasure and profit he had derived from being able to attend so many of them. Next to the exhibitions of the Society, nothing has conduced so much to its popularity and usefulness as these weekly discussions. The bringing together of persons, interested in the same objects, to compare the results of their experience, is the most powerful agency in advancing progress and improvement in our age, and so it will continue to be in all coming time. The knowledge obtained at these meetings is valuable to all those who attend them, and moreover is very widely disseminated by the publication of our proceedings. Many of the papers read have been printed in full, not only in our American journals, but also in the horticultural journals of England. He therefore felt a deep interest in the perpetuation of these meetings, and hoped that they might be continued from year to year, and that the Society might go on, with increasing prosperity, long after he should have been consigned to the bosom of mother earth.

The meeting then adjourned without day.

The following letter from Parker Earle, President of the American Horticultural Society, was received by Mr. Wilder too

late to be incorporated into his paper, but is deemed, by the Committee on Publication, of sufficient interest to be printed here.

COBDEN, ILL., April 10, 1886.

My Dear Mr. Wilder:—

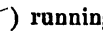
I have just now returned from my winter home on the Gulf Coast, and find your letter awaiting me. My son tells me that he dropped you a line explaining the delay.

I am glad you are preparing a paper on the important topic of "The Ripening and Preservation of Fruits." I am very willing to contribute suggestions from my own experience, which has mostly been confined to cold storage for exhibition purposes, and to refrigeration during transportation. I have also been a frequent visitor to cold storage houses which were carrying fruits for commercial purposes.

The best results I have known in cold storage on a large scale have been accomplished without ice, but by ice-making machinery —the Pictet system, or the Boyle system will do this—where the cold is produced in the storage rooms by the circulation of refrigerated brine, at a temperature of 16° Fahrenheit, through extensive systems of iron pipes placed in the tops of the cooling rooms; the amount of brine circulated (and hence the amount of the cold produced in a given room) being regulated by stopcocks. This system is perfectly adapted to large or moderate sized establishments, and the degree of cold can be adapted to the varying wants of the rooms with ease and certainty.

Next to this come the cold houses where large bodies of ice are stored above the fruits, the amount of cold being determined by the sliding of doors or valves. In all cases the houses should be constructed with several dead air spaces in the walls and floors (very cheaply secured by successive linings of building paper, separated by strips of wood). In smaller rooms the ice can be introduced daily, according to the wants of the produce stored; and the degree of cold easily determined by the quantity. For this purpose an ice pan, with proper drainage, can be arranged in the upper part of any room sufficiently isolated from external influences, and the ice put in as wanted.

The most successful refrigerator cars are built upon this plan. The Tiffany car, which is by far the best adapted of any for the transportation of fruits, is constructed with a V shaped ice pan

() running the entire length of the car; this pan being filled through the top of the car. This pan reaches to within one foot of the wall of the car on eachs ide. The operation is simply this: The warm air, laden with surplus moisture, rises from the load of fruit below, passes over the ice, which cools the air and condenses the moisture, and the air descends cold and comparatively dry. The result is constant circulation of the air in the car (or the room) without any machinery, or any ventilation; and the constant cooling of the cargo, with an atmosphere sufficiently dry for the good of the fruit. It is all done by that force which causes heat to ascend and cold to descend. It makes no difference whether the storage room be on the ground or on wheels.

There is no doubt that the durability of all fruits is increased by a proper amount of cold. But it has been a common belief that fruits exposed to artificial cold would, when taken out, decay much more rapidly than they naturally do. I think this is a decided mistake when the cold has not been excessive. For instance, the exhibits of apples and other fruits from certain States, made at the great International Exhibition of Fruits in connection with the World's Exposition at New Orleans, were in part placed in cold storage in that city several months before they appeared on our tables. It was generally expected that they would melt down in a very few days. But they lasted in a most surprising manner. As a general thing they lasted for a good many weeks upon the exhibition tables. I particularly recall some plates of Maiden's Blush apples, from Pennsylvania, which were in cold storage for three months, and then stood upon our tables in Horticultural Hall, which was nearly all glass in walls and roof, in good condition for over two months. In fact, the manner in which this cold storage fruit, from many States and from across the sea, endured the exposure in our moist and often quite warm palace of horticulture was a surprise and gratification to all who had any knowledge of the facts.

My own experience in the transportation of strawberries, raspberries, blackberries, and other fruits to market in Tiffany cars, and the excellent keeping quality they have shown when taken out, has been most encouraging.

For all these purposes we want no chemicals, no machinery for the circulation of the air, and no ventilation; simply perfect isola-

tion from outside influences, the right amount of ice, or other cooling agency, and a free chance for the air of the apartment to come in contact with the ice, or cooling pipes, to deposit its moisture and part with its heat.

I have the honor to remain, with great regard and esteem,

Very truly yours,

PARKER EARLE.

ERRATA.

On page 66, line 9 from bottom, for "serenity" read "endurance."
On page 67, line 2, for "tutors" read "teachers."

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1886.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, May 1, 1886.

The meeting of April 10 having adjourned to this day was called to order by the President, HENRY P. WALCOTT, but no quorum was present and the meeting

Adjourned to Saturday, June 5.

BUSINESS MEETING.

SATURDAY, June 5, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

EDWARD C. CABOT, of Brookline.
T. R. CALLENDER, of Wellesley Hills.
VARNUM FROST, of Belmont.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 3, 1886.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The President reported that the Executive Committee had approved the appropriation of $235 for prizes for roses at the Rose Show in June, in addition to the amount previously appropriated. The appropriation was unanimously voted by the Society.

William C. Strong moved that in compliance with the regulations of the State Board of Agriculture a prize of $10 be offered for the best plantation of ship timber, and that the prizes offered last year for the best reports of awarding committees be offered the present year.

The motion was unanimously carried.

On motion of Edward L. Beard, it was voted that the Secretary be authorized to send to the meeting of the Society of American Florists, in Philadelphia, August 18, a letter expressing the sympathy of this Society with the aims and efforts of the Society of Florists, and that William J. Stewart be the bearer of the letter, as the representative of this Society.

CHARLES RIPLEY, of Dorchester, and
LUTHER ADAMS, of Brighton,

having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected.

Adjourned to Saturday, August 7.

BUSINESS MEETING.

SATURDAY, August 7, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The President, as Chairman of the Executive Committee, reported a recommendation that some preparatory action be taken

by the Committee on Establishing Prizes, in reference to the meeting of the American Pomological Society in this city, in 1887; and also that the same Committee consider the subject of Forestry Prizes. The report was unanimously adopted.

Agreeably to the Constitution and By-Laws, the President appointed the following Committee to nominate suitable candidates for the various offices of the Society for the year 1887: William C. Strong, Chairman; C. H. B. Breck, Edward L. Beard, Charles N. Brackett, Charles F. Curtis, Francis H. Appleton, C. M. Atkinson.

Adjourned to Saturday, September 4.

BUSINESS MEETING.

SATURDAY, September 4, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair. William C. Strong, Chairman of the Committee to nominate candidates for officers and standing committees for the next year, reported a printed list which was accepted. It was voted that the Committee be continued and requested to nominate candidates in place of any who might decline before the election.

On motion of William C. Strong, it was voted, as the sense of the meeting, that the Committee on Plants and Flowers should award, during the present month, such gratuities as they deem for the interest of the Society, not to exceed $200, in anticipation of the approval of the Executive Committee and of the Society at the October meeting.

The Secretary presented, in behalf of William J. Stewart, a photograph of members of the Society of American Florists, taken in the grounds of George W. Childs, at Philadelphia. It was voted that the picture be accepted and that the thanks of this Society be presented to Mr. Stewart therefor.

JULIUS A. PALMER, JR., of Boston, and
FRANCIS B. SNOW, of Dorchester,

having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 2, 1886.

A stated meeting of the Society, being the Annual Meeting for the choice of officers and standing committees, was holden at 11 o'clock, Vice-President C. H. B. BRECK in the chair. The Recording Secretary stated that the requirements of the Constitution and By-Laws in regard to notice of the meeting had been complied with.

Agreeably to the Constitution and By-Laws, the chair appointed Charles L. Fowle, William H. Spooner, and Robert Manning a Committee to receive, assort, and count the votes given, and report the number.

The polls were opened at a quarter past eleven o'clock, and it was voted that they be kept open for one hour. It was also voted that the check list be used.

The Chairman reported from the Executive Committee a recommendation that an additional appropriation of $200 be made for the Committee on Plants and Flowers for gratuities. The appropriation was unanimously voted.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members:

DUNCAN AIRD, of Belmont.
GEORGE MCWILLIAM, of Whitinsville.
EDWARD J. FORSTER, M. D., of Charlestown.
JOHN H. HAINES, of Roxbury.

The polls were closed at a quarter past twelve o'clock, and the Committee to receive, assort, and count the votes, after attending to that duty, reported

The whole number of ballots cast . . .	48
Necessary for a choice	25

And the persons having the number necessary for a choice were, agreeably to the Constitution and By-Laws, declared by the presiding officer to have a majority of votes, and to be elected Officers and Standing Committees of the Society for the year 1887.

Adjourned to Saturday, November 6.

BUSINESS MEETING.

SATURDAY, November 6, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The President, as Chairman of the Executive Committee, reported from that Committee a recommendation that the Society appropriate $6,000 for prizes for the year 1887. Also, that in view of the meeting of the American Pomological Society, an additional sum, not exceeding $500, be appropriated for Special Prizes for Fruits at the Annual Exhibition.

The report was accepted, and, agreeably to the Constitution and By-Laws, laid over until the stated meeting in January.

On motion of William H. Spooner, it was *Voted*, That the Committee of Arrangements make inquiries in regard to a more spacious hall for the Annual Exhibition.

On motion of Edward L. Beard, it was unanimously *Voted*, That the Finance Committee be authorized to dispose of the bonds purchased as a Sinking Fund, and apply the proceeds towards to the payment of the mortgage debt on the Society's building.

The following named persons, having been recommended by the Executive Committee for membership in the Society, were, on ballot, duly elected:

ELBRIDGE BAKER, of Wellesley.
WILLIAM P. RICH, of Chelsea.
WILLIAM H. TEEL, of West Acton.
LEVERETT M. CHASE, of Roxbury.
Professor WILLIAM G. TOUSEY, of College Hill.
JOHN W. SCOTT, of Nahant.
ALLEN V. ABBOTT, of Boston.

Adjourned to Saturday, December 4.

BUSINESS MEETING.

SATURDAY, December 4, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The Annual Report of the Committee on Vegetables was read by Charles N. Brackett, Chairman, accepted, and referred to the Committee on Publication.

The Annual Report of the Committee on Plants and Flowers was read by Joseph H. Woodford, Chairman, accepted, and referred to the Committee on Publication.

The Chairman of the Committee on Fruits asked for further time to prepare his report, which was granted.

The President as Chairman of the Executive Committee, presented the Schedule of Prizes for 1887 with the recommendation that $3,300 be appropriated for Prizes and Gratuities for Plants and Flowers instead of the $3,000 previously recommended, and also that the Schedule be referred back to the Committee for Establishing Prizes, for amendment, so as to leave a balance of $150 for gratuities. The report was accepted, and the Schedule was referred as therein recommended.

It was *Voted*, That notice be given, in the report of the meeting in the daily papers, to all members who wish to discuss the Schedule, that it will be considered at the next meeting of the Society, and that when this meeting adjourn it be for one week.

The Committee of Arrangements were authorized to secure the Great Hall of the Mechanics' Building for the Annual Exhibition in 1887, on the most favorable terms.

The President read the following Report and Vote, which had been addressed to him:—

Sir: The Committee appointed at the meeting of the Society held on the second day of January, 1886, to consider the suggestions made by the President in his inaugural address in regard to the necessity of procuring better accommodations for the exhibitions

of the Society than it now enjoys, beg to report: That, in their opinion, the building owned by the Society cannot be altered to meet the requirements, either in space or convenience, of an exhibition of plants which would properly illustrate the actual development and importance of Massachusetts Horticulture. More space is required for our exhibitions, and space into which large plants can be easily and safely transported without the risk which attends their transportation to the second or third story of any building; and more space is absolutely needed for the unsurpassed and inestimably valuable library of the Society.

Your Committee has examined various sites in different parts of the city with the view of recommending the purchase of a piece of land and the erection upon it of a new building adapted to the actual needs of the Society. It has not been possible, however, to find any piece of unoccupied land in a suitable locality and of sufficient size for this purpose. Your Committee, nevertheless, has caused to be prepared a plan which is now submitted for your consideration, of a proposed horticultural building, which they believe will, if it can be built, afford the Society all the accommodations it will require, and they recommend that the President of the Society be authorized, in the name of the Society, to petition His Honor the Mayor of Boston for authority to erect a building of this general character on the Public Garden of the city at some convenient point on Boylston Street.

It seems to be peculiarly fitting that the exhibitions of the Society should be held in the garden of the city, and it is the opinion of your Committee that if this scheme can be adopted the usefulness of the Society will be greatly extended, to its own advantage and to the benefit of the people of Boston. It is suggested, in case this plan can be adopted, that a portion of the second story of the building should be finished as offices and offered to the city of Boston for the use, without rent, of the Municipal Board of Park Commissioners, who very properly would thus become closely associated with our Society, whose influence might properly be exerted in shaping and influencing the Park policy of the city. It is proposed to supplement the building with a large tent, to be used at the time of our principal exhibitions; in which large plants could be grouped easily, safely, and effectively. The cost of such a building is estimated to be fifty thousand dollars, a sum of money which can be easily raised upon

the property of the Society. Your Committee recommend the passage of the enclosed Vote, and beg to be discharged.

C. S. Sargent,
C. M. Hovey,
F. L. Ames. } *Committee.*

The Vote, recommended by the Committee, is as follows:

Voted, That the President of the Society be requested to petition His Honor the Mayor of Boston, for authority to build, under conditions to be arranged hereafter, a building at some point on Boylston Street in the Public Garden, for the uses of the Society.

The Report was accepted and the Committee discharged, and the Vote was adopted.

The following named persons, having been recommended for election as members of the Society, were, on ballot, duly elected:

Edwin H. Jose, of Cambridgeport.
Aaron Low, of Essex.
Dr. Orren S. Sanders, of Boston.
Augustus Andrews, of Dorchester.

Adjourned to Saturday, December 11.

BUSINESS MEETING.

Saturday, December 11, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Henry P. Walcott, in the chair.

On motion of Edward L. Beard it was voted that the consideration of the Schedule of Prizes for 1887 be first in order. The Committee on Establishing Prizes reported the Schedule, amended in accordance with the instructions given on the 4th instant. The subject was fully discussed by Mr. Beard, the President, William J. Stewart, William C. Strong, Joseph H. Woodford, C. M. Hovey, and E. W. Wood, and the Schedule thus amended was then referred back to the Executive Committee for approval, agreeably to the Constitution and By-laws.

The annual report of the Fruit Committee was read by E. W. Wood, Chairman, accepted, and referred to the Committee on Publication.

The annual report of the Library Committee was read by William E. Endicott, Chairman, accepted, and referred to the Committee on Publication. Agreeably to a recommendation in this report, it was voted that the Society's Silver Medal be conferred upon George E. Davenport, in recognition of the services rendered by him to the Society by the presentation in 1875 of the valuable Herbarium of Ferns formed by him, and especially of his continued zeal in adding to it many rare and valuable specimens.

Robert Manning read his Annual Report as Secretary and Librarian, which was accepted and referred to the Committee on Publication.

Adjourned to Saturday, December 18, at 11 o'clock.

BUSINESS MEETING.

SATURDAY, December 18, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

President Walcott addressed the meeting as follows:

It seems strange that an official announcement of the death of one of the oldest and earliest members of this Society should be in any sense a surprise; and yet we who, within two short weeks, saw in this hall, busy with the affairs of his best-loved association, a man of eighty-eight years, who had carried the vigor of middle life into extreme old age — we have felt the shock of a sudden parting. Marshall P. Wilder was a member of this Society since 1830, president for several years, and member of the Executive Committee at the time of his death — always a leader here — he was an interested exhibitor and competitor at our latest exhibition. A loving admirer of our past, he gladly recognized the merits of the present time, and looked forward contentedly to a future improvement, though it might not be his work.

We shall miss him and we shall mourn for him, yet was he supremely fortunate in his death.

" Why weep we, then, for him who, having won
The bound of man's appointed years at last,
Life's blessings all enjoyed, life's labors done,
Serenely to his final rest has passed?
* * * * *
And I am glad that he has lived thus long,
And glad that he has gone to his reward;
Nor can I deem that Nature did him wrong,
Softly to disengage the vital cord.
For ere his hand grew palsied and his eye
Dark with the mists of age, it was his time to die."

Ex-President W. C. Strong said that the members of the Society were in the presence of a great sorrow. Mr. Wilder had been with them so long and his presence had been such a benediction that it was hard to give him up. The speaker moved that a committee be appointed to submit resolutions on the death which had occasioned so great a loss to the Society; which motion was unanimously passed.

The Chair appointed as that Committee Ex-Presidents Strong, Hovey, and Hyde, Edward L. Beard and Robert Manning.

On motion of Benjamin G. Smith, the following persons were appointed a Committee to attend the funeral of Mr. Wilder, on the next day:

The President, HENRY P. WALCOTT.

The Ex-Presidents,—

Charles M. Hovey, William C. Strong,
James F. C. Hyde, Francis Parkman,
John B. Moore.

The Vice-Presidents,—

John Cummings, C. H. B. Breck,
Benjamin G. Smith, Frederick L. Ames.

Members of the Executive Committee,—

H. H. Hunnewell, Charles S. Sargent,
H. Weld Fuller, William H. Spooner,

and the following named members:—

Robert Manning, John G. Barker,
George W. Fowle, Edward L. Beard,

John Robinson,	O. B. Hadwen,
E. W. Wood,	Francis H. Appleton,
Joseph H. Woodford,	John C. Hovey,

Charles N. Brackett.

The President, as Chairman of the Executive Committee, reported a recommendation that certain changes be made in the prizes proposed to be offered for Chrysanthemums, and that an additional sum of $154 be appropriated for Prizes and Gratuities for Plants and Flowers. The Schedule was then referred back to the Committee for Establishing Prizes.

The President also reported, from the Executive Committee, a recommendation that the following appropriations be made for the year 1887:—

For the Library Committee, for the purchase of magazines and newspapers, binding of books and incidental expenses of the Committee .	$300
For the same Committee, to continue the Card Catalogue of Plates	100
For the Committee on Publication and Discussion	250
For the Committee of Arrangements,—this sum to cover all extraordinary expenses of said Committee	300

Agreeably to the Constitution and By-Laws, all the appropriations recommended were laid over until the January meeting.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1886.

By JOSEPH H. WOODFORD, CHAIRMAN.

The exhibitions during the year about to close have been of unparalleled excellence. Competition has been stimulated by the largely increased premiums, and a general interest, manifested by both old and young members, to make our exhibitions worthy of the name and reputation of the leading Horticultural Society in this country has filled our halls to repletion on each exhibition day with the choicest plants and flowers. Constant additions to the list of competitors have made the arrangement of exhibitions somewhat embarrassing to your Committee, inasmuch as it has been difficult at times to know just how to apportion space for the different exhibits. Yet working in harmony with the able Committee of Arrangements, we have incurred very few complaints of even seeming injustice or partiality; and it has been one of the aims of your Committee to treat all with the utmost courtesy and consideration, giving to each exhibitor, in the order of application, the best space left unoccupied, for the display of plants or flowers.

The Society is to be congratulated on the success of its prize exhibitions, for never in its history has the quantity or quality of the exhibits been equalled. If more space is not soon acquired, your Committee, in conjunction with the Committee of Arrangements, will be compelled to limit contributors at our great exhibitions to allotments of space, which must be applied for in advance.

We are glad to be able to report such an enthusiasm in floricul-

ture, and the wonderful success of this year's exhibitions, and now beg leave to review the shows in succession, as they took place during the year.

Beginning with the 2nd of January, E. Sheppard placed upon the table some fine blooms of new and old Pelargoniums. Mrs. Francis B. Hayes showed a good plant of Epacris, and a variety of cut flowers from the greenhouse. C. M. Hovey exhibited eight plants of *Helleborus niger* in varieties, but mostly of muddy colors. Some of the varieties of this plant are desirable and are very useful when well grown and of clear colors.

January 9. Mrs. A. D. Wood showed several pots of *Freesia refracta alba*, well flowered, and Mrs. F. B. Hayes and Mrs. E. M. Gill cut flowers in variety.

January 16. Edwin Fewkes exhibited six pots of Roman Hyacinths with numerous good spikes of flowers; and Mrs. F. B. Hayes a large variety of cut flowers.

January 23. David Allan was awarded a First Class Certificate of Merit for *Urceolina pendula aurea*, a bulbous plant, like Nerine in growth, with gracefully drooping flowers. John B. Moore & Son showed fine specimens of Hybrid Perpetual Roses Mad. Gabriel Luizet and Marquise de Castellane. Mrs. A. D. Wood arranged a nice vase of flowers. C. L. Allen & Co. were awarded a First Class Certificate of Merit for skill in the culture of Hinze's White and Black Carnations, the blooms shown by them being very fine. Mrs. F. B. Hayes showed a large variety of cut flowers. Jackson Dawson showed six varieties of *Helleborus niger*. Mrs. P. D. Richards exhibited *Hepatica triloba* in bloom, and various wild berries from the wood.

January 30. James Comley was awarded a First Class Certificate of Merit for a seedling Hybrid Tea Rose, which he has named Francis B. Hayes; color crimson tinged with magenta, quite fragrant and strong growing. Mrs. F. B. Hayes exhibited the new Rhododendron Star of Flanders, and a large variety of cut flowers. C. M. Hovey brought a seedling Camellia. Jackson Dawson showed Lily of the Valley and *Andromeda Japonica* in pots, both well flowered.

February 6 was the first prize day of the year; and although the morning was very cold the exhibition proved a fine one. Mrs. A. D. Wood, who has been the largest cultivator of *Free-*

sia refracta alba, took the first prize for well-grown pans of that useful flower. Edwin Fewkes and Mrs. E. M. Gill took the first and second prizes for Roman Hyacinths. J. B. Moore & Son showed some excellent blooms of Hybrid Perpetual Roses. Mrs. F. B. Hayes exhibited splendid forced Lilacs and a large quantity of cut flowers. The fragrance of Lilacs at this inclement season of the year is very grateful; and the blooms, of a delicate white, were shown in profusion.

February 13. Mrs. F. B. Hayes exhibited plants of *Eriostemon myrtifolium*, and *E. microphyllum*; also splendid cut flowers of Roses, Orchids, etc. Mrs. A. D. Wood contributed a handsome vase of flowers. C. M. Hovey made a fine show of Azaleas, Camellias, and other cut flowers.

February 20. As the Spring approached, the exhibitions assumed greater magnitude, although as yet there had been little or no incentive in the way of prizes. Mrs. F. B. Hayes showed *Rhododendron Veitchianum*, a grand plant, with large white fragrant flowers; also two good Azaleas, a *Dendrobium nobile*, and a variety of cut flowers. J. B. Moore & Son showed fourteen varieties of Hybrid Perpetual Roses in perfection, among which were Duke of Teck, Mrs. Harry Turner, and Marquise de Castellane. C. M. Hovey showed about twenty varieties of Camellias, Mrs. E. M. Gill and S. S. Hovey, cut flowers in variety, Mrs. A. D. Wood, *Freesia refracta alba*, and Mrs. P. D. Richards a collection of ferns, mosses, and wild berries.

February 27. The weather was very cold this morning, nevertheless there was a fine exhibition. J. B. Moore & Son contributed some beautiful Hybrid Perpetual Roses, among which were Mrs. John Twombly, Sir Garnet Wolseley and Fisher Holmes. Mrs. F. B. Hayes sent two pots of Rose Magna Charta in fine bloom, besides a large quantity of cut flowers. C. M. Hovey brought a large and varied collection of Camellias, and Edwin Fewkes and Jackson Dawson, Roses in variety.

March 6. James Comley entered for the Prospective Prize a seedling Hybrid Tea Rose, to which he has given his own name; color pink; of robust growth; a cross between Baroness Rothschild and President. J. B. Moore & Son were awarded a First Class Certificate of Merit for superior culture of Hybrid Perpetual Roses, particularly Mad. Gabriel Luizet; the blooms shown today were most beautiful. Jackson Dawson exhibited Roses

grown on a Japan stock. The plants were taken from the open ground in November, and were of superior growth and quality. E. M. Wood & Co. presented some very large Cornelia Cook Roses. Norton Brothers showed fine blooms of Baroness Rothschild Roses. David Allan was awarded a First Class Certificate of Merit for a well flowered specimen of *Cattleya Roezlii speciosa*. A. W. Spencer exhibited a large plant of *Dendrobium Wardianum*—a very fine specimen and well flowered. C. M. Hovey showed a large collection of Camellias, also *Andromeda Japonica*, Double Cinerarias, and Azaleas. Among the latter was a very large cluster of a fine white seedling, named Snowball. James O'Brien showed some Cyclamens of remarkably vivid colors, and forced Lilacs. Mrs. F. B. Hayes sent a large display of Azaleas, Himalayan Rhododendrons, etc. E. Sheppard brought twelve pots of Cinerarias, and cut flowers in variety; Mrs. E. M. Gill, a fine plant of Amaryllis Aurora and a quantity of cut flowers; and S. S. Hovey and Mrs. A. D. Wood, cut flowers in variety.

March 13. Jackson Dawson exhibited twelve pots of Hybrid Perpetual Roses grafted on the Japan stocks *Rosa multiflora* and *R. parviflora* — very fine bushy plants, and wonderfully floriferous. J. B. Moore & Son showed splendid blooms of Hybrid Perpetual Roses, including Baroness Rothschild and White Baroness. Theodore N. Vail contributed twelve pots of Cinerarias; Mrs. F. B. Hayes, Roses, Azaleas, and elegant Rhododendrons; C. M. Hovey, a fine collection of Camellias; John L. Gardner, some extra large Neapolitan Violets; Mrs. E. M. Gill, a variety of cut flowers; and Mrs. A. D. Wood, a nice basket of flowers; the whole making an excellent exhibition.

SPRING EXHIBITION.

March 24, 25, and 26.

The grand Spring Exhibition opened March 24, and was at once conceded by all who visited it to surpass any of its predecessors. On entering the Lower Hall we were greeted with a fine collection of Azaleas contributed by the veterans of our Society, Hon. Marshall P. Wilder and C. M. Hovey. *Azalea exquisita*, from Mr. Wilder, was fully seven feet in diameter; and Azalea Suzette, from Mr. Hovey, was of about the same size—both evi-

dently companions of these gentlemen in their youth. A Bronze Medal was awarded to Miss Dove, of Andover, for *Ouvirandra fenestralis*, or Lace Plant, a native of Madagascar. This was a fine specimen, fully four feet in diameter, and was displayed in a large tub in the Lower Hall.

The arrangement of the Upper Hall, which was completely filled with plants and flowers, was in excellent taste, the table and platforms being so conveniently placed as to allow visitors free access to view the different exhibits from all sides. At the rear end of the Hall, on a receding stage, was arranged a grand collection of sixty Indian Azaleas, contributed by Arthur W. Blake. These consisted of the newest and choicest varieties, and were completely covered with their pure and beautiful flowers. At the rear of this fine group, and interspersed among it, were gracefully drooping Palms, the whole forming one of the most brilliant features of the show.

Hybrid Perpetual Roses, in pots, were staged by Jackson Dawson, Mrs. F. B. Hayes, N. T. Kidder, and E. Sheppard. Cut blooms of Hybrid Perpetual Roses were shown in profusion by J. B. Moore & Son, Mrs. F. B. Hayes, S. Niel, W. H. Elliot, E. Sheppard, N. S. Simpkins, and Mrs. E. M. Gill.

Orchids were shown in great variety by F. L. Ames, David Allan, H. H. Hunnewell, E. W. Gilmore, N. T. Kidder, and W. A. Manda. The collection of orchids staged by David Allan was most beautifully interspersed with choice Adiantums and other ferns; thereby greatly adding to the gorgeous beauty of their flowers. Some of the most beautiful of the orchids exhibited were as follows:

Cattleya amethystoglossa,
" *Lawrenceana*,
" *Triancæ*,
Cœlogyne flaccida,
" *cristata*,
Cymbidium Linawianum,
Dendrobium Ainsworthii,
" *densiflorum*,
" *Dominii*,
" *Linawianum*,
" *nobile*,
" *splendidissimum*,
Dendrobium Wardianum,
Odontoglossum Alexandræ,
" *nebulosum*,
" *Pescatorei*,
" *Roezlii album*,
" *triumphans*,
Phalænopsis Schilleriana,
" *Stuartiana punctata*,
Cypripediums in variety,
Lælias " "
Oncidiums " "
Vandas " "

The *Dendrobium nobile* presented by David Allan was a grand specimen with over four hundred flowers.

Hardy shrubs and herbaceous plants were shown by C. M. Hovey; Cyclamens by James O'Brien, and E. Sheppard; Hardy Primroses by Joseph Tailby, and Edwin Fewkes; Cinerarias by E. W. Gilmore, E. Sheppard, and George Seaverns; Violets, in pots, by N. T. Kidder, S. Niel, and E. Sheppard—those from Mr. Kidder were very fine. Carnations, of six varieties and in large bunches, came from J. A. Foster. C. M. Hovey showed a fine collection of Camellia blooms, a plant of *Gesnera macrantha*, and a good collection of Azaleas and Pelargoniums.

The prizes for Dinner Table Decorations were well competed for, W. A. Manda carrying off the first prize. The foundation of his design was a well branched plant of Bilbergia, which afforded a collection of natural vases holding the water and the flowers — a very novel and effective arrangement. The other prize winners, in order, were J. O'Brien, Mrs. E. M. Gill, C. M. Hovey, and Miss S. W. Story.

A Bronze Medal was awarded to Weigand Brothers, for Weigand's Giant Mignonette, bearing the largest spike of that delightfully fragrant flower that has been yet produced here.

John N. May was awarded a Silver Medal for the new Tea Rose The Bride. This is a sport from Catharine Mermet, in color white, but very slightly tinged with pink on the outside petals; as beautiful in form as its parent, and fully as floriferous — a valuable acquisition to the list of White Tea Roses.

W. A. Manda made a grand display of forced herbaceous plants, from the Botanic Garden of Harvard University, and they attracted a great deal of attention, as it was quite a new feature of our exhibitions to have this class of plants so largely shown in pots at this season of the year. Jackson Dawson staged some good seedling Azaleas; also Primroses and forced hardy shrubs. E. W. Gilmore showed in his collection of plants some very fine specimens of Calceolarias; and he was awarded a gratuity for elegant arrangement of plants to produce a good general effect. N. S. Simpkins exhibited three pots of English Primroses, which for beauty of growth and profusion of flowers received the praise of every one who saw them.

A First Class Certificate of Merit was awarded to Charles J. Powers for a new double white Narcissus; and the same to

Denys Zirngiebel for Pinks: La Purité, white, and Andalusia, yellow fringed. They had the appearance of being splendid varieties and of great promise.

Gratuities were awarded to S. S. Hovey, E. Sheppard, and George Seaverns, for cut flowers in variety; J. B. Moore & Son for three vases of splendid Hybrid Perpetual Roses; and Mrs. F. B. Hayes for a general display of flowers and plants, among the latter of which was a remarkably large specimen of *Cocos Weddelliana*. Gratuities were also awarded to H. H. Hunnewell for plants and cut flowers; F. L. Ames, for orchids and cut flowers; and David Allan, for ferns, orchids, and cut flowers.

The display of Dutch Bulbs was the most extensive and the most beautiful ever witnessed in our halls. C. M. Hovey and C. H. Hovey contributed pots of these elegant and showy flowers by the hundred, and their exhibition alone was a revelation to many of what a feast of beauty can be spread out — and at very little expense or trouble — by any one who is disposed to cultivate these easily grown plants.

Their method of flowering these plants is as follows: — They procure the bulbs in September or October and pot them in good rich soil, and then bury the pots in a cold frame. The object gained by burying the pots is that when the roots of the bulbs begin to grow they will not be forced upward and out of the pots, the weight of earth on top holding the bulbs firmly in place. About a month before the bulbs are wanted in flower, the pots are brought into a moderate greenhouse, where, if they are properly watered and attended to, they are sure to produce an abundance of splendid fragrant flowers. Bulbs are the easiest of all plants to flower well, for they are already grown to produce flowers when we buy them.

The General Union of Holland for the Promotion of the Cultivation of Bulbs may well be esteemed a public benefactor, for in its desire to increase the cultivation of bulbs it has furnished, to be offered by our Society, gold and silver medals for hyacinths in bloom. Our friends abroad not only grow the bulbs for us, but by their munificence stir up a competition for skill in flowering them; giving us both the benefit of the flowers and the honor of wearing medals which they provide.

At this exhibition C. H. Hovey won the First Prize, a Gold Medal, for fifty pots of Hyacinths; these being a very superior col-

lection of well flowered bulbs. C. M. Hovey won the Silver Gilt Medal and the Silver Medal, as second and third prizes, for collections of fifty pots.

The names of the bulbs in the collection taking the Gold Medal are as follows:

Agnes, bright carmine.
Argus, dark blue, white eye.
Baron Von Tuyll, deep purple.
Blanchard, white.
Blondin, porcelain blue.
Bouquet Tendre, delicate rose.
Canning, deep porcelain blue.
Charles Dickens, soft rose.
Circe, very dark red.
Cissa, sky blue.
Cosmos, deep rose.
Czar Peter, porcelain lilac.
Fabiola, pink, carmine striped.
Garrick, double, blue.
General Pelissier, light blue.
Gertrude, rosy pink.
Ida, fine yellow.
Josephine, brilliant red.
La Grandesse, white.
Laurens Koster, double, dark blue.
Lord Derby, rich red.
Lord Wellington, pale pink.
Louis Philippe, double, light blue.
Mad. Zoutman, double, deep pink.
Mrs. Beecher Stowe, rich rosy red.
Norma, waxy pink.
Paix de l'Europe, white.
Pelissier, very dark red.
Pieneman, deep rich blue.
Queen Victoria, white.
Seraphine, very delicate pink.
Veronica, carmine red.
Vesta, white.
Von Schiller, deep crimson striped..

N. T. Kidder carried off the Society's first prize for twelve pots of Hyacinths; C. H. Hovey the second; and C. M. Hovey the third. N. T. Kidder took the first prize for six pots of Hyacinths; Edwin Fewkes the second, and C. M. Hovey the third. C. M. Hovey took the first prize for three pots of Hyacinths; N. T. Kidder the second, and C. H. Hovey the third. C. M. Hovey took the first prize for one Hyacinth, and C. H. Hovey the second. N. T. Kidder took the first and second prizes for a pan of ten Hyacinths, and C. M. Hovey the third.

Tulips, in pots, were shown in great profusion by C.M. Hovey, N. T. Kidder, and C. H. Hovey. The show of Narcissus, Daffodils, and Jonquils, by C. M. Hovey, was superb, and the general display of spring bulbs by him was grand in the extreme. Lilies of the Valley, in pots, very fully flowered and very fragrant, were exhibited by Jackson Dawson, E. L. Beard, and C. M. Hovey, and Anemones by Jackson Dawson.

After following the Schedule of Prizes in the above report, we noticed that a great many other plants of special merit were placed on the stands and tables, but space will not allow of a detailed account of them; suffice it to say that the Spring Exhibition of this year will long be remembered as being replete with everything essential to make it appreciated by the public, and well worthy of our Society.

April 3. C.M. Hovey entered for the Prospective Prize his seedling Camellia, Florence Hovey; color mauve crimson, flower large and symmetrical. Mrs. F. B. Hayes exhibited some very fine flowers of Himalayan Rhododendrons, such as *R. Henderianum*, *R. Veitchianum*, *R. arboreum*, *R. jasminoides*, etc.; also a good variety of cut flowers of Roses, Azaleas, Lapagerias, etc. Mrs. E. M. Gill was awarded a First Class Certificate of Merit for a seedling Amaryllis—Italia—beautifully striped with crimson on a white ground, clear in color, vigorous in habit and of a good form. A. W. Spencer and F. L. Ames each exhibited well flowered plants of *Dendrobium chrysotoxum*; Edwin Fewkes pots of tulips, and Miss S. W. Story cut flowers in variety. Jackson Dawson presented a noble plant of *Rosa multiflora*, from Japan. The flowers are white, single, and in great panicles, very fragrant: it is a splendid lawn plant, being entirely hardy in this climate. This plant had, by careful computation, two thousand four hundred flowers and buds on it, and was awarded a First Class Certificate of Merit.

April 10. A very large collection of pans of forced hardy plants was presented by W. A. Manda, among which were *Aquilegia oxypetala*, *A. glandulosa* and *A. cœrulea*. *A. glandulosa* was particularly fine; color light blue, tipped with white; large flowers, and dwarf in habit. A First Class Certificate of Merit was awarded for it. C. M. Hovey contributed a collection of Camellia blooms, a seedling Amaryllis, and Rhododendron Countess of Sefton. Miss S. W. Story and S. S. Hovey brought a variety of cut flowers.

April 17, Robert T. Jackson was awarded a First Class Certificate of Merit for *Primula viscosa* var. *nivalis*; pure white in color; flowers compact, foliage thick and glossy, and plant dwarf in habit. Mr. Jackson also showed a collection of polyanthus primroses, including Golden Laced and Hose-in-hose. E. Sheppard showed fourteen new varieties of Pelargoniums in fine large trusses; also,

Rhododendrons, Azaleas, and Heaths. E. H. Hitchings made quite an interesting display of that harbinger of Spring, the *Hepatica triloba*, both blue and white; also, Tussilago, etc.

April 24, C. M. Hovey entered for the Prospective Prize the seedling Azalea Memory of Mrs. Hovey; color white, with lower lip shaded greenish yellow. He also showed Azaleas Eulalia Hovey and Mrs. J. R. Carter, and a plant of Rhododendron Duchess of Sutherland. Miss A. C. Kenrick showed blooms of *Magnolia conspicua* and Mrs. F. B. Hayes a plant of Rhododendron Countess of Haddington. Mrs. P. D. Richards exhibited native flowers in variety and and a large collection of Ferns, Mosses, etc., from the wild woods.

May 1. As usual at this season of the year, all cultivators of the soil are so busy in their gardens and greenhouses that they do not find time to devote to our Saturday exhibitions. Consequently the contributions have been somewhat curtailed of late; and more particularly today, when only two exhibitors appeared, Mrs. E. M. Gill and Miss S. W. Story; each of whom exhibited cut flowers in variety. In Mrs. Gill's collection we noticed some good large pansies.

MAY EXHIBITION.

May 8.

This being a "prize day," although every one having to do with plants and flowers is very busy at this season of the year, a fair show was made, which resulted in drawing a goodly attendance, notwithstanding the weather was rainy. C. M. Hovey was the only exhibitor of Pelargoniums in pots; and although his plants did not show that superior excellence in cultivation usually seen in his exhibits he was awarded the first and second prizes for Fancy and Zonale Classes. Mr. Hovey was also awarded the second and third prizes for three Indian Azaleas, the first prize not being awarded. N. T. Kidder received the first prize for a single plant of Azalea, the variety being Distinction; and Hon. Marshall P. Wilder took the second prize with Louis Van Houtte. C. M. Hovey's first prize collection of Hardy Bulbs was very good, while J. H. Woodford's second prize collection was only ordinary. Mrs. E. M. Gill received the first prize for a Basket of Flowers.

Her collection of fifty blooms of Pansies was composed of very large and fine specimens, and she received the first prize for the same; J. H. Woodford being second, and E. Sheppard third.

Hardy Herbaceous Plants were exhibited in great profusion; these are to be commended for permanent gardens, as a judicious selection will insure continuous bloom throughout the whole season.

The collection of Orchid blooms from David Allan was a lovely feature of this exhibition, and was greatly admired. Mrs. F. B. Hayes sent a fine collection of greenhouse and hardy flowers, among which were Himalayan Rhododendrons, Double Flowering Cherries, (the common and Waterer's varieties), Magnolias, *Daphne Cneorum*, and Japan Pears with very large and showy flowers. N. T. Kidder exhibited fine Gloxinias; and David Allan some good Auriculas. This plant is hardy when protected from the sun by shading with evergreen boughs. E. Sheppard showed fine trusses of Pelargoniums.

The collection of Herbaceous Plants and Shrubs shown by W. A. Manda, from the Botanic Garden, was very interesting. Robert Manning brought a large vase of cultivated *Trillium grandiflorum*, which was remarkably fine and showed a decided improvement in consequence of generous garden treatment. Wild flowers were shown by Mrs. P. D. Richards, E. H. Hitchings, and C. W. Sanderson. The display was large and varied, and attracted much attention. Prof. W. P. Wilson sent from North Carolina *Asarum Canadense*, *A. arifolium*, (Wild Ginger), and *Chrysoganum Virginianum*. There were cut flowers in profusion from Miss S. W. Story, J. H. Woodford, and Mrs. L. P. Weston.

May 15. The exhibition of Herbaceous Perennials and other hardy plants and shrubs was remarkably good today. The Flowering Apples shown by Mrs. F. B. Hayes deserve special notice, as they are very floriferous and highly ornamental as lawn trees. Miss A. C. Kenrick showed blooms of Magnolia *Soulangeana*, *M. Lennei*, and *M. speciosa*. Cut flowers were shown in profusion by Mrs. L. P. Weston, Mrs. E. S. Joyce, and Mrs. E. M. Gill.

May 22. As the Spring progressed, the interest in our Saturday exhibitions increased. Another interesting and instructive show of garden shrubs, herbaceous plants, and wild flowers, was made today, and a great number of appreciative visitors were present.

Among the numerous collection from the Botanic Garden were *Iris Iberica* and some splendid Cactus blooms. From the Arnold Arboretum Jackson Dawson brought eight varieties of Lilacs, some of them much superior to any now in general cultivation — notably *Syringa pubescens* and *S. villosa*.

J. W. Manning also showed a large number of Flowering Shrubs, all of which were named. The other contributors were Miss S. W. Story, J. H. Woodford, Mrs. E. M. Gill, Edwin Sheppard, Mrs. L. P. Weston, and E. H. Hitchings. Mrs. P. D. Richards brought fifty species of wild flowers, including ten varieties of native violets. James W. Clark brought the Wild Mandrake, (*Podophyllum peltatum*), Mrs. H. L. T. Wolcott, Pansies; C.M. Hovey, a Hydrangea and Tulips; and Frank Forbes a bouquet of wild flowers.

May 29. The exhibition was enlivened by a grand collection of forty-three named varieties of tender Rhododendrons and seventy-two varieties of hardy kinds, the first of the season, from H. H. Hunnewell, foreshadowing what might be expected at the prize exhibition for this class of shrubs on the next Saturday.

Mrs. F. B. Hayes also contributed a large collection of flowers and foliage from trees and shrubs, among which were twelve varieties of Japan Maples, four varieties of Hawthorns, six varieties of Lilacs, and three varieties of Horse Chestnuts. Hon. Marshall P. Wilder sent a large collection of Tree Pæonies, among which was a fine seedling named for him by the originator, Dr. J. P. Kirtland, and a seedling of his own, named Mima.

J. W. Manning made an interesting show of herbaceous plants, and he was awarded a First Class Certificate of Merit for *Onosma stellulata*. The same award was made for *Gaillardia grandiflora maxima*, to W. A. Manda; who staged a large collection of herbaceous plants besides. J. H. Woodford showed six pans of Clematis, in great variety. E. H. Hitchings showed a fine collection of native plants, including a large vase of *Azalea nudiflora*, very beautiful and fragrant.

RHODODENDRON SHOW.

June 5.

This Exhibition of Rhododendrons was the most extensive and complete within the recollection of the oldest members of our So-

ciety. The largest contributor to this grand show was H. H. Hunnewell, who placed in the Society's vases over one hundred named varieties of tender and an equal number of hardy kinds, which, with a line of brilliant Azaleas between, completely filled a large table running the whole length of our hall. In view of this unprecedented display, your Committee voted unanimously that the very highest tribute of appreciation within their power should be conferred upon this sumptuous exhibition, and therefore the Society's Gold Medal was awarded to Mr. Hunnewell, for his magnificent display.

Some of the most beautiful varieties (nearly all half-hardy) were as follows:

Bacchus.
Baron Schroeder.
Baroness Rothschild.
Crown Prince.
Duchess of Bedford.
Duchess of Edinburgh.
F. D. Godman.
Frederick Waterer.
George Paul.
Helen Waterer.
James McIntosh.
John Walter.
Kate Waterer.
Lady Grey Egerton.
Marie Stuart.
Martin F. Sutton.
Michael Waterer.
Mrs. Arthur Hunnewell.
Mrs. W. Agnew.
Princess Mary of Cambridge.
Ralph Sanders.
Sigismund Rucker.
Sir Joseph Whitworth.
William Austin.
W. E. Gladstone.

Most of the prizes for Rhododendrons were taken by Mrs. F. B. Hayes, she having filled a large table with these blooms; which, taken with the other flowers shown by her, made by themselves a grand exhibition. Some of the finest of her varieties were

Auguste Van Geert.
Austin Layard.
Baroness Lionel de Rothschild.
Brice Findlay.
Charlie Waterer.
Countess of Cadogan.
Countess of Ilchester.
Countess of Normanton.
Duchess of Bedford.
Duke of Portland.
Earl Cadogan.
Earl Haddington.
E. W. Waterer.
Frank Gomer Waterer.
Jack Waterer.
John Maclure.
Lady Harcourt.
Lady How.

Lord Selborne.	Oliver Haywood.
Lord Wolseley.	Omer Pacha.
Marchioness of Lansdowne.	P. H. Waterer.
Miss Alice de Rothschild.	Princess Louise.
Mrs. F. Hankey.	Princess of Wales.
Mrs. Layard.	Purity.
Mrs. Russell Sturgis.	Robert Marnock.
Mrs. Tom Agnew.	Samuel Morley.
Mrs. Tritton.	Sir Richard Wallace.
Mrs. Williams.	The Queen.
Nero.	Victoria.

Mrs. Hayes, E. Sheppard, and C. M. Hovey showed some fine trusses of Azaleas. Tree Pæonies were shown by Hon. Marshall P. Wilder; German Iris by A. H. Fewkes and J. W. Manning; Clematis in variety by J. H. Woodford; Hardy Trees and Shrubs by J. W. Manning; one hundred bottles of cut flowers, each, by Mrs. A. D. Wood, Mrs. L. P. Weston and Mrs. E. M. Gill; Native Plants by Mrs. P. D. Richards and E. H. Hitchings.

A varied collection, and one of unusual excellence was brought from the Botanic Garden by W. A. Manda; included in it was a large plant of *Sarracenia flava*, well flowered, for which he was awarded a Bronze Medal. W. H. Spooner exhibited the Stanwell Perpetual Scotch Rose, which is hardy, fragrant, and a perpetual bloomer.

Denys Zirngiebel was awarded a First Class Certificate of Merit for Myosotis Empress; a new kind, of deep blue color.

Jackson Dawson brought from the Arnold Arboretum eighteen new seedling Rhododendrons, for which he was awarded a Silver Medal. He also exhibited a very large collection of beautiful new flowering shrubs, all named.

Sewall Fisher exhibited seven varieties of new seedling Carnations possessing good qualities sufficient to warrant the Committee in awarding the Society's Bronze Medal.

E. L. Beard staged five well bloomed plants of *Cattleya Mendelii*. There were a great many other interesting features in this exhibition, which, coupled with those of the preceding one as noted, have made these days memorable in the history of our Society. They mark many degrees of progress in the cultivation of Hardy Flowering Shrubs.

Mrs. P. D. Richards staged about seventy species and varieties of Native Plants, including nearly all that were then in blossom in this vicinity; a very interesting collection for the student, as they were all named. E. H. Hitchings also presented a large collection of named native flowers, including eight native Orchids, viz:

Arethusa bulbosa,
Calypso borealis,
Corallorhiza innata,
Cypripedium acaule,
Cypripedium pubescens (rare),
Liparis liliifolia,
Orchis spectabilis,
Pogonia verticillata.

June 12. The interest in floriculture was certainly on the increase, for this exhibition was the best we have ever seen when not a "prize day"— although the grand show of roses, made by our principal growers, was only a forerunner of the "feast of roses" to occur at the Annual Rose Exhibition a few days later.

Extensive displays of roses were made by W. H. Spooner, Warren Heustis & Son, B. G. Smith, and J. S. Richards. Among Mr. Spooner's collection we noticed several fine varieties of Moss Roses. John B. Moore & Son contributed Paul's new single Hybrid Perpetual Roses, White and Crimson. Jackson Dawson brought from the Arnold Arboretum a collection of nineteen *species* of roses, which were of great interest to botanists.

H. H. Hunnewell contributed seventy named varieties of Rhododendrons; the following were noted as among the finest:

Duchess of Connaught,
Jack Waterer,
Madame Cavalho,
Marshall Brooks,
Mrs. Walter,
Purity,
The Queen.

Mrs. F. B. Hayes also sent a splendid collection of Rhododendrons; some of the more striking were

Charles Noble,
Congestum nigrum,
Conspicua,
Delicatissimum,
Fastuosum flore pleno,
John Spencer,
Lady Rowe,
Mrs. Heywood,
Oculatum nigrum,
Sir Joseph Whitworth (very dark color).
Surprise (very fine truss),
William Cowper.

Mrs. Hayes was awarded a First Class Certificate of Merit for a new seedling Clematis, flowers very large, color light lavender with purplish bars; a very handsome flower.

F. C. Hook exhibited a large collection of Aquilegias, of clear delicate colors, fine forms, and in great variety; for which he was awarded a First Class Certificate of Merit. Jackson Dawson showed a new Hydrangea from China, hardy, and of a soft yellow color, for which the same award was made. He also showed a large collection of hardy flowering shrubs, gathered from the four quarters of the globe.

W. A. Manda brought from the Botanic Garden an interesting collection of herbaceous plants. J. W. Manning had also a large collection of plants of the same class; among them we noticed a fine spike of *Lilium monadelphum*. Collections of cut flowers were shown by Miss S. W. Story, Mrs. L. P. Weston, Mrs. E. S. Joyce, Mrs. E. M. Gill, Mrs. A. D. Wood, and Miss E. M. Harris. E. H. Hitchings brought wild flowers from the woods, including a large vase of *Kalmia latifolia*.

June 19. It is not usually the case that flowers in great variety are brought in on the Saturday just preceding one of our great prize exhibitions, but today proved an exception, for very interesting collections from various exhibitors were presented. Among them was a fine display of Aquilegias from A. H. Fewkes, to which was awarded a First Class Certificate of Merit. Mr. Fewkes also showed five varieties of good Moss Roses, and various other flowers.

J.W. Manning exhibited nine varieties of Herbaceous Pæonies—Sulphurea, Alba, Old Pink, Claptoniana, Fulgida, Humeii, Louis Van Houtte, Bicolor, and Delachii. William Hobson showed thirty-three varieties of *Dianthus barbatus*, and B. G. Smith a large collection of Roses, Pæonies, etc. E. H. Hitchings brought a large collection of wild flowers, including *Kalmia latifolia* of a very deep pink color.

ROSE AND STRAWBERRY EXHIBITION.

June 22 and 23.

The Annual Exhibition of Roses, Stove and Greenhouse Plants, and Cut Flowers, at this season of the year is looked forward to

by all lovers of the beautiful in nature as an event of great importance. Great anxiety is also manifested by the expected exhibitors, and much care is exercised in the selection of the various specimens for exhibition. The season has been propitious, and the "Queen of Flowers" is dressed in her best robes waiting only the gardener's pleasure when she shall be introduced to her admirers at the Hall. The various exhibits are arranged and the large hall is completely filled with a collection of floral beauty unrivalled by any previous exhibition.

Beginning with the schedule numbers in order, the awards were as follows:

Hybrid Perpetual Roses.—To Warren Heustis & Son, the first prize for twelve Merveille de Lyon; these were superb, both in size and color. David Allan and John B. Moore & Son, for Alfred Colomb; David Allan, and Mrs. F. B. Hayes, for Baroness Rothschild; Mrs. F. B. Hayes, and John B. Moore & Son, for John Hopper; W. H. Spooner, for Merveille de Lyon; Mrs. F. B. Hayes, and David Allan, for Mad. Gabriel Luizet: J. B. Moore & Son, for Mad. Victor Verdier; J. B. Moore & Son, for Thomas Mills; W. H. Spooner, for six new varieties sent out since 1882.

For seventy-two blooms, J. B. Moore & Son were awarded the first prize, and Warren Heustis & Son the second. For thirty-six blooms, J. S. Richards took the first prize, and J. B. Moore & Son the second. For eighteen blooms, W. H. Spooner received the first prize, and J. S. Richards the second. For nine blooms, J. S. Richards received the first prize, and Mrs. F. B. Hayes the second. For six Moss Roses, J. B. Moore & Son received the first prize. For three varieties of Moss Roses, in clusters, Edwin Fewkes received the first prize, J. B. Moore & Son the second, and W. H. Spooner the third. For the display of Hybrid Tea Roses, J. S. Richards was first, and Warren Heustis & Son second. For the general display, filling one hundred bottles, W. H. Spooner was first, J. S. Richards second, J. B. Moore & Son third, Edwin Fewkes fourth, and B. G. Smith fifth.

One of the great features of the Rose Show was the spirited competition for the special prizes offered by the Society. These prizes were of such value as to call forth the best exertions of our rose growers, and a lively contest was the result; and a large collection of splendid blooms was staged.

The first prize for twenty-four blooms of Hybrid Perpetual Roses

(no duplicates) was awarded to David Allan; the second prize to J. S. Richards.

The prize for twelve varieties of Hybrid Perpetual Roses, to J. L. Gardner.

The prize for eighteen varieties of Hybrid Perpetual Roses, to J. S. Richards.

The prize for six varieties of Hybrid Perpetual Roses, to J. B. Moore & Son.

The prize for a general display of Roses grown in open culture—all classes except Hybrid and Moss, to C. M. Hovey.

The prize for a Table Decoration of Roses, to J. H. Woodford.

The first prize for twenty-four varieties of Hybrid Perpetual Roses, by an amateur, to J. L. Gardner; the second to J. S. Richards.

STOVE AND GREENHOUSE PLANTS.— The first prize for five was awarded to J. L. Gardner, who also took the first prize for a Specimen Flowering Plant with *Rhynchospermum jasminoides*.

F. L. Ames took the first prize for a Specimen Foliage Plant, and C. M. Hovey the second; the plant in both cases being *Dracæna Lindeni*.

ORCHIDS.—F. L. Ames was awarded the first prize for twelve Orchids, viz: —

Aerides expansum,	*Epidendrum vitellinum majus*.
Cattleya Mendelii,	*Lælia Schrœderi*,
Cymbidium Lowianum,	*Masdevallia Harryana*,
Cypripedium barbatum superbum,	*Odontoglossum Alexandræ*,
Cypripedium caudatum roseum,	*Odontoglossum Cobbianum*,
Dendrobium thyrsiflorum.	*Vanda tricolor*.

The second prize was awarded to David Allan.

The first prize for six Orchids was awarded to David Allan; the second prize to F. L. Ames; and the third to Thomas Greaves.

F. L. Ames took the first prize for a specimen Orchid with *Lælia purpurata*, and Thomas Greaves the second with *Cattleya Mendelii*.

HERBACEOUS PÆONIES.— The first prize was awarded to John C. Hovey for a very fine assortment, as follows:—

Cambridge,	Perfection,
Dorchester,	Rosea Elegans,
F. B. Hayes,	Rubra Superba,
Grandiflora,	Festiva,
Norfolk,	Splendens.

The first eight in the list are seedlings, raised by John Richardson of Dorchester, and are not only remarkable for their very double fine forms and brilliant colored flowers, but also for their great size when compared with most of the imported varieties. A number of them have been exhibited and noticed in former reports of our Committee, viz.: Perfection was awarded a Silver Medal in 1869; Dorchester received a First Class Certificate of Merit in 1870; Rubra Superba the same in 1871, and Grandiflora the same in 1883.

The second prize went to Hon. Marshall P. Wilder.

SWEET WILLIAMS.—The prizes were awarded to E. Sheppard, L. W. Goodell, and Edwin Fewkes, in order as named.

VASE OF FLOWERS. — Mrs. E. M. Gill, took the first prize, Mrs. A. D. Wood the second and Miss S. W. Story the third.

A Bronze Medal was awarded to Edwin Fewkes & Son for Delphiniums having splendid compact spikes and beautiful colors. Denys Zirngiebel showed *Delphinium Breckii*, the new Clove Pink Mrs. Simkins, and an improved Candytuft. Robert Manning exhibited a large vase of *Actinidia polygama*, in fine bloom, which was much admired. This is a comparatively new climber from Japan, not only beautiful in flower and foliage but (when the pistillate and staminate parts are both present) producing fruit of pleasant flavor.

W. A. Manda made a fine display, from the Botanic Garden, of orchids, stove and greenhouse plants, and cut flowers. David Allan's orchids were again shown interspersed with ferns, palms, and cut flowers, which gave his collection a very beautiful appearance.

Mrs. P. D. Richards, Miss Mary L. Vinal, and E. H. Hitchings brought great quantities of wild flowers from the woods, which attracted much attention. Numerous other contributors made excellent displays of flowers, the aggregate of which, added to the graceful decorations of the Hall, produced a grand effect, fully appreciated by a large number of visitors.

July 3 will long be remembered as one of the "rosy" days of the year. Since the grand annual show on the 22d and 23d of June, your Committee had caused to be constructed a stage, running the whole length of the centre table in the Lower Hall, for the purpose of exhibiting roses in the Society's vases, singly, and in a manner such as to give visitors a chance to study each rose by

itself, and to see the beauty of each individual flower. The veteran rose-growers were appealed to, and they came forth in their strength, contributing not less than seven hundred of the choicest blooms, which made the hall not only radiant with beauty but redolent with their delicious fragrance. Your Committee feel considerably elated at the success of this arrangement, for it was conceded by all who saw it to be the very best table of Roses ever exhibited before our Society.

A Silver Medal was awarded to John B. Moore & Son for their grand show, comprising one hundred and sixty named varieties of Hybrid Perpetual Roses, with a large number of duplicates.

J. S. Richards staged over two hundred unnamed varieties of Hybrid Perpetual Roses, and he was awarded a Bronze Medal. Warren Heustis & Son staged fifty Hybrid Perpetual Roses, and Mrs. F. B. Hayes sent in about one hundred and fifty.

This exhibition comprised in its entirety a "feast of roses" never to be forgotten. It was undoubtedly the finest display of roses, considering the lateness of the season, ever made in this country.

A wonderful and novel display of hardy Alpine Sempervivums was made by John C. Hovey, comprising forty-five species and varieties; and he was awarded a Bronze Medal. The names are as follows:

Acuminatum.
Arachnoideum.
Arenarium.
Assimile.
Arvernense.
Boutignianum.
Braunii.
Calcareum.
Chrysanthum.
Compactum.
Cornutum.
Dollianum.
Elegans.
Fimbriatum.
Flagelliforme.
Glaucum.
Globiferum.
Grandiflorum.
Heterotrichum.
Heuffeli.
Hirtum.
Hispidum.
Hutesi.
Longifolium.
Lamotti.
Montanum.
Neilrichi.
Niederi.
Patens.
Pilosella.
Powelli.
Reginæ Amaliæ.

Rubicunda.
Ruthenicum.
Rupestre.
Schlehani.
Snittspani.
Sordidum.
Soboliferum.
Spinosum.
Stenopetalum.
Tectorum.
Tectorum rusticum.
Tomentosum.
Triste.

John L. Gardner was awarded a Silver Medal for Japan Irises (*Iris Kœmpferi*), shown in rose boxes; they were remarkably fine blooms of this species.

This day also marked the beginning of our weekly Saturday shows; and as our report is liable to be too verbose for publication if we enter into detail with each exhibition, we will only notice those features of each presenting uncommon interest. The prizes are always recorded, and as the Committee's record list is printed herewith for the information of those interested, it will not be necessary in this report to detail the names of all the prize-takers.

July 10. Japan Irises were shown today by John L. Gardner, James F. C. Hyde, and E. Fewkes & Son. Those shown by Mr. Gardner were magnificent blooms and gave evidence of great skill in cultivation.

John B. Moore & Son showed several large vases of superior blooms of Hybrid Perpetual Roses.

Samuel P. Fowler was awarded a First Class Certificate of Merit for seedling *Asclepias tuberosa* of various shades of yellow.

The collections of Flowering Shrubs and Plants from the Arnold Arboretum and Botanic Garden, and the displays of Hardy Herbaceous Plants and Native Plants by our usual exhibitors, were all quite full and received favorable comment from a large attendance of visitors.

July 17 was Prize Day for Hollyhocks, and the display was very large. Besides those offered for prizes, collections were shown by C. F. Curtis, W. S. Ward, George Seaverns, Miss E. M. Harris, and Mrs. E. S. Joyce. The show of wild flowers was also very full. Mrs. Richards' collection comprised between sixty and seventy species. Mrs. H. D. Wilmarth presented a large vase of the beautiful *Sabbatia chloroides*, including a white variety. Frank C. Hyde showed about one hundred species and varieties of wild flowers. The displays of herbaceous plants were also large and good.

July 24 was Prize Day for Perennial Phlox and Sweet Peas. The latter flower has deservedly come to the front of late, and is being very greatly improved. We noticed in M. B. Faxon's display twelve named kinds, some of them very beautifully colored. We look for much more extended cultivation of this very fragrant flower in the immediate future. The display of Hollyhocks was also very fine, particularly the exhibit made by J. F. C. Hyde, for which he was awarded a First Class Certificate of Merit.

Rare plants exhibited today were a great attraction. F. L. Ames presented *Cattleya Gaskelliana* with fifty-one gorgeous flowers, and he was awarded the Society's Silver Medal. David Allan showed *Grammatophyllum Ellisii*, a new orchid from Madagascar, and it was awarded a First Class Certificate of Merit. C. M. Hovey showed a yellow Hedychium, *Eugenia myrtifolia*, and flowers of *Stuartia pentagyna*.

Mrs. F. B. Hayes sent a most beautiful new Godetia with white flowers blotched with carmine; also a Scabious of novel form and color, together with Gloxinias, Achimenes, etc. W. H. Spooner again showed the Stanwell Perpetual Scotch Rose. Walter Blanchard showed some very beautiful Double Poppies, pure white edged with carmine. Collections of flowers were also shown by E. Fewkes & Son, Miss E. J. Burbank, W. A. Manda, E. Sheppard and others. The Hydrangea plants shown by J. L. Gardner were very fine, particularly the Otaksa, which occupied the centre of the stage, and presented a grand appearance. Native Plants in large variety were displayed by Mrs. P. D. Richards and E. H. Hitchings.

July 31. Another full exhibition today and several things of unusual excellence. J. W. Manning showed a large collection of Herbaceous Plants, among which was *Lilium superbum*, with a stalk ten feet long, surmounted with twenty-one flowers. W. H. Spooner showed the Perpetual Scotch Rose Stanwell, which was in its second blooming of this season. J. F. C. Hyde was awarded a First Class Certificate of Merit for splendid blooms of Double Hollyhocks. Jackson Dawson brought from the Arnold Arboretum nine species of Hardy Heaths and seven species of Hypericums.

Severance Burrage staged a collection of wild flowers, including *Lilium Philadelphicum*, color reddish chocolate — a very distinct variety, found at Osterville; and *Lygodium palmatum*, found in West Newton. W. A. Manda, Mrs. Richards, and Mr. Burrage

made good and varied showings of Native Ferns. Mrs. P. D. Richards, Frank C. Hyde, Miss Mary L. Vinal, and E. H. Hitchings showed very interesting collections of wild flowers.

August 7. The exhibition of wild flowers today was something wonderful, and showed the indefatigable perseverance of our collectors. Severance Burrage showed one hundred and eighty species and varieties, all named, while Mrs. P. D. Richards and E. H. Hitchings had each nearly as many. E. H. Hitchings presented a large vase of *Lilium superbum*, which well deserved its specific name. W. H. Spooner again showed the Perpetual Moss Rose Salet. This is a fine variety and blooms all summer.

August 14. The principal attraction today was Gladioli. The best shown were by James Cartwright. M. B. Faxon filled fifty vases with new and old varieties of Sweet Peas, and he was awarded a First Class Certificate of Merit, for superior culture of this most beautiful and fragrant flower.

F. L. Ames was awarded a First Class Certificate of Merit for *Cattleya Eldorado Amesiana*. Among Mrs. F. B. Hayes' collection of beautiful flowers, we noticed *Bignonia præcox*, one of the most beautiful of that genus. Warren Heustis & Son made an excellent display of Hybrid Perpetual Roses, and N. T. Kidder made a fine display of Achimenes.

August 21 was Prize Day for Asters, and the display exceeded any ever before recorded, both in quality and quantity. The centre table running the whole length of the hall was covered by M. B. Faxon, who placed thereon for display two thousand three hundred blooms; besides one hundred blooms on another table for prizes. He was awarded the First Prizes in the Pæony and Victoria Classes, and the Second Prize for Pompons. Besides those whose names appear in the Prize List, more or less extensive displays were made by S. S. Hovey, W. W. Rawson, W. Patterson, Mrs. F. B. Hayes, Miss S. W. Story, P. T. Jackson, Warren Heustis & Son, and Mrs. E. M. Gill, there being in all thirteen contributors.

J. Warren Clark showed seedling Gladioli of rare excellence, and he was awarded a Silver Medal therefor. He was also awarded a First Class Certificate of Merit for a seedling Gladiolus named Excelsior, having sixteen expanded flowers.

Warren Heustis & Son filled a large vase with La France Roses, of garden culture. This is probably the best garden rose yet in-

troduced, for it is very fragrant, of good color, and always in bloom.

August 28. A very large collection of Single Dahlias was shown by W. A. Manda, filling one hundred and fifteen bottles; and as the blooms were of superior excellence, they were awarded a Silver Medal. A First Class Certificate of Merit was given to Denys Zirngiebel, for improved Asters. Elegant specimens of La France Roses were shown by Mrs. F. B. Hayes and Warren Heustis & Son.

September 4. This was Prize Day for Annuals, and besides the competing collections W. A. Manda filled the entire centre table, comprising seven hundred vases. J. L. Gardner exhibited six well-grown Fuchsias, for which he was awarded a First Class Certificate of Merit. J. W. Clark made another display of fine seedling Gladioli, and H. B. Watts showed a large collection of Lemoine's superb new hybrids, among which was Enfant de Nancy; very remarkable for its deep velvety crimson color. A First Class Certificate of Merit was awarded to Mr. Watts for them. George S. Tuttle showed very handsome Liliputian Dahlias, he having the finest strain in this vicinity. Mrs. P. D. Richards displayed seventeen species of Solidago, and nineteen species of Asters, all correctly named — each genus "native and to the manor born." The collections of plants and flowers by other exhibitors taxed the hall to its utmost capacity, making altogether a fine show.

This was the last of the regular Saturday Exhibitions, and it is a pleasure to record that, owing to the interest manifested in these weekly shows, nearly all the prizes offered in the Schedule have been taken; although this left but a small balance for gratuities. Nevertheless, the innate love for the beautiful by which our contributors are animated has not been deadened by mercenary motives,— they have given freely of their abundance, and have thereby made our weekly shows a procession of grand successes.

ANNUAL EXHIBITION.

September 14, 15, and 16.

The Annual Exhibition was memorable for its completeness in every particular. In fact, the contributions were so extensive as to embarrass the Committee of Arrangements, by the excess of

horticultural treasures which were poured in from all the famous greenhouses, conservatories, and stoves in this vicinity. Enough plants were massed on the allotted platforms to fill effectively a much larger hall than we have at our disposal. Yet when these plants were arranged, under the guidance of the skilful and efficient head gardeners of the several establishments represented, never did the Hall present such a grand appearance.

One of the principal attractions was the tanks of Water Lilies and Nelumbiums which were placed near the entrance. Here were seen, and appearing perfectly at home in their native element, specimens of the order of Nymphæaceæ ranging from the magnificent *Victoria regia* down to the most diminutive member. The flowers of *Nymphœa Devoniensis*, *N. dentata rubra*, and *N. Zanzibariensis* shown by N. S. Simpkins, were the largest and best specimens ever exhibited, and of the finest colors. For the first, Mr. Simpkins was awarded the Society's Silver Medal.

Edmund D. Sturtevant was also awarded a Silver Medal for a new variety of *Victoria regia*, the flowers of which on first opening are pure white, but before the end of the second day gradually change to dense pink or deep red — a very curious transformation.

Evergreen Trees and Shrubs.—W. C. Strong was awarded the first Hunnewell prize for these, having shown a fine collection; which was used to decorate the stairway and entrance.

Stove and Greenhouse Plants.—The prizes for six Greenhouse or Stove Plants were awarded to S. R. Payson, F. L. Ames, G. A. Nickerson, and N. T. Kidder, in order as named.

Specimen Flowering Plants.—The first and third prizes for the best three went to David Allan, and the second to F. L. Ames. For one Flowering Plant, the first, second, and third, to F. L. Ames, David Allan, and N. T. Kidder, respectively.

Variegated Leaved Plants.— The prizes for the best six were taken by F. L. Ames, N. T. Kidder, and C. M. Hovey The first and second prizes for single specimens were awarded to G. A. Nickerson, for Crotons Queen Victoria and Variabilis, two magnificently colored plants nearly eight feet high and densely clothed; the third prize to J. L. Gardner, for *Eurya latifolia*, a very large specimen.

Caladiums.—Finely colored plants were shown by N. T. Kidder.

Ferns and Lycopods were exhibited in great profusion by

F. L. Ames, David Allan, N. T. Kidder, G. A. Nickerson, and C. M. Hovey, and they were generally very large and well-grown specimens.

Dracænas, Crotons, and Palms.—Very fine specimens were shown by H. H. Hunnewell, E. W. Gilmore, F. L. Ames, and G. A. Nickerson.

Nepenthes were shown by S. R. Payson and F. L. Ames.

Orchids came from F. L. Ames, E. W. Gilmore, David Allan, C. M. Hovey, W. A. Manda, and H. H. Hunnewell.

Cut Flowers.—The stands of flowers of one hundred and fifty bottles each were very fine, and were kept in good condition by renewals every day. Prizes for these were awarded to Mrs. E. M. Gill, C. M. Hovey, and W. K. Wood, in order as named.

The Baskets of Flowers were also of great excellence, and reflected the good taste of the fabricators. The prizes went to J. O'Brien, Mrs. A. D. Wood, Mrs. E. M. Gill, and Miss S. W. Story, in order as named.

Dahlias.—The large flowered kinds were not equal in quality to those shown last year, but the Liliputians far exceeded in quality all at past exhibitions, those shown by George S. Tuttle deserving special mention for excellence in form and colors.

W. A. Manda's collection of Plants from the Botanic Garden deserves special mention. It was arranged at the far end of the Hall, extending up into the alcove, in a pleasing and graceful manner, and forming a splendid bank of tropical foliage such as is but rarely seen, even in an exhibition of the magnitude of ours.

J. L. Gardner staged a fine collection of stove and greenhouse plants. Among the latter were excellent examples of Fuchsias.

H. H. Hunnewell was awarded a First Class Certificate of Merit for *Davallia Figiensis*, a fern with dark glossy green foliage, and the same for seedling Dracænas. W. C. Strong showed a large collection of Foliage of Variegated Trees and Shrubs. Other exhibits of excellence were made by numerous persons, which added to the general effect, and the whole produced a grand show of which the Society may justly feel proud.

October 2. Although no prizes were offered for flowers today, a fair exhibition was made by eight of our regular contributors, proving that the interest in our shows still exists, and will continue to the end of the year, only to begin again with the incom-

ing of the New Year. W. H. Spooner showed a large bunch of the Moss Rose Salet, confirming what we had before seen of its habit of blooming all the season.

October 23. E. W. Wood showed a fine plant of Chrysanthemum Alexandre Dufour, an *avant-courier* of what was to come a little later on.

CHRYSANTHEMUM SHOW.

November 10, 11, and 12.

The Chrysanthemum Exhibition this year was not of such superior excellence and finish as we recollect two years ago, yet if some of our older growers are not as successful as they could wish there are others coming forward to fill up the gaps, so that as the year draws to a close we do not lack for a continuation of bloom, at a season when summer's glorious flowers are no more.

The plants, when critically examined, were not quite equal to those of the two preceding years. Yet, when viewed *en masse*, they presented a wealth of color and brilliancy fully compensating for any deficiency in the individual flowers. The upper hall was filled with plants in pots, while in the lower hall three long tables were filled with cut flowers, orchids, and ferns.

The new Seedling Chrysanthemums shown this year deserve more than a passing notice, for some of them were of exceeding excellence, and we have no doubt that on further acquaintance they will prove so good as to obtain a high place in the estimation of growers. Our worthy President, Dr. Walcott, presented ten fine plants; one of which, B. 25, received a Silver Medal last year, and now fully sustained the commendation for wealth of bloom and beauty of color (deep yellow) that it received when first exhibited. Dr. Walcott was awarded the Society's Silver Medal for his general collection of seedlings, and First Class Certificates of Merit for C. 22, a large pink Japan variety, and Nevada, a large white Chinese variety. C. 10, which was certificated last year, still maintained its position for beauty of form and color, yet like all the other Chinese varieties, this season, the plants exhibited were not well grown. Arthur H. Fewkes' collection of seedlings was remarkably superior. They were grown from seed which had been cross-fertilized by hand, and the successful results of this systematic crossing showed plainly in the abundance of flowers and the bushy

habit of plants grown naturally, without pinching. His method is to be commended as the right one to produce new colors and plants of superior quality. He was awarded the Society's Silver Medal for his general collection of seedlings, and First Class Certificates of Merit for President Hyde, a large Japanese Golden-ball; Lizzie Gannon, a Japanese variety of medium size and plump, quilled, clear yellow flowers; and H. A. Gane, a Japanese flower, pink in color, of large size — the plant very floriferous. The seedlings above enumerated show an advance in the right direction, and the method of attaining them is hereby commended.

Mrs. M. J. Plumstead showed cut blooms of seedling Chrysanthemums, one of which presented a delicate clear pink complexion; and so fine a form, that it was deemed worthy of a name: your Committee named it "Mrs. Leighton" and awarded it a First Class Certificate of Merit.

Edwin Fewkes & Son staged about one hundred plants, which taken as a whole were the best collection exhibited. Messrs. Fewkes received the first prize for Thirty Plants, and the first prizes in all the classes of cut blooms they competed for. President Walcott's general collection of Chrysanthemum plants (not entered for competition) showed careful cultivation, the plants having attained very great size and being well flowered. Mrs. Francis B. Hayes showed about thirty plants. Edwin Sheppard exhibited some fine plants and an endless variety of cut blooms. J. W. Scott, gardener to George Abbott James, and P. Malley staged some fine plants. Hon. Marshall P. Wilder also staged thirty plants of sturdy growth and well flowered. William Martin showed some fine plants of Japanese kinds, and some well grown standards. W. A. Manda showed some of the best grown Chinese and Pompon varieties in the Hall, but as they were not entered in competition they received only gratuities.

The most noticeable feature of our show was the scarcity of Chinese flowers, most of the growers saying their plants of that class "went blind" this year, but they are unable to account for it in a satisfactory manner so that the trouble may be avoided in the future. It will be well to compare notes and try to arrive at a solution of the difficulty.

The display of Orchids was very good. F. L. Ames's collection was handsomely interspersed with ferns and palms, thus giving

his stand a very finished appearance. He received the first and second prizes for three plants, as follows:

Cattleya gigas imperialis,	*Miltonia Clowesii*,
Cattleya marginata,	*Oncidium varicosum*,
Cœlogyne Massangeana,	*Vanda cœrulea.*

William Martin, gardener to N. T. Kidder, received the third prize for three plants, and the second prize for a single plant.

Mr. Ames received the first and third prizes for single plants — *Renanthera coccinea* and *Cypripedium Harrisianum* respectively. We also noticed several other very beautiful plants in Mr. Ames's collection, viz:

Cattleya fausta crispa,	*Tillandsia Lindenii vera*,
Oncidium Rogersii,	*Vriesia brachystachys.*

W. A. Manda brought also a good collection of orchids and cut flowers from the Botanic Garden.

Norton Brothers showed the following roses in perfection; Mermet, The Bride, William F. Bennett, American Beauty, Perle des Jardins, and La France.

Charles F. Evans, of Philadelphia, showed a new white rose called The Puritan, one of Bennett's hybrids. This rose is remarkable for wealth of foliage close under the bud, pure white color, and sturdy growth. It was awarded a First Class Certificate of Merit.

John Henderson of Flatbush, N. Y., exhibited a new Tea Rose named Père Gontier. This rose is crimson scarlet in color, of good fragrance, and larger than Bon Silène but similar in form. It possessed enough good qualities to warrant the Committee in awarding it a First Class Certificate of Merit.

Mrs. Francis B. Hayes, had a fine collection of Roses, Camellias, Lapagerias, and other cut flowers, and Edwin Sheppard presented a large variety of Pelargonium flowers, which, with their vivid colors, made a bright spot on one of the tables. Other exhibitors contributed to this annual show, and by their offerings aided to make it worthy of our Society and a splendid ending of the year's successful exhibitions.

J. W. Manning, having gained the greatest number of first prizes for Herbaceous Plants during the season is entitled to the

Society's Silver Medal, and Mrs. L. P. Weston, being second, is entitled to the Bronze Medal. The first prize for Annuals was taken by Mrs. E. M. Gill the most times and she is entitled to the Society's Silver Medal, and as Miss S. W. Story was second she is awarded the Bronze Medal.

Special prize No. 137, offered by a Member of the Society for the best six blooms of any Hybrid Perpetual rose, to be judged by a scale of points, was not awarded. Special prize, No. 138, offered by another Member for the best twelve blooms of Merveille de Lyon was awarded to Warren Heustis. The sum of $62 was awarded in prizes from the "Hunnewell Premiums" for Rhododendrons and Azaleas.

The amount appropriated by the Society for the use of our Committee was $3,235. Of this amount, $2,276 has been awarded in prizes in accordance with the Schedule, and $929 in gratuities.

We close this report with congratulations to the Society on the success of its exhibitions.

JOS. H. WOODFORD,
ROBERT T. JACKSON,
DENYS ZIRNGIEBEL,
EDWIN FEWKES,
WARREN H. MANNING,
F. L. HARRIS,
DAVID ALLAN.
} *Committee.*

PRIZES AND GRATUITIES AWARDED FOR PLANTS AND FLOWERS.

January 2.

Gratuities:—

C. M. Hovey, Hellebores in variety,	$2 00
Mrs. Francis B. Hayes, Cut Flowers, and Heath in pot,	2 00
Edwin Sheppard, Cut Flowers,	1 00

January 9.

Gratuities:—

Mrs. A. D. Wood, Freesias in pots,	3 00
Mrs. Francis B. Hayes, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00

January 16.

Gratuities:—

Edwin Fewkes, six pots of Roman Hyacinths,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	1 00

January 23.

Gratuities:—

Mrs. A. D. Wood, Vase of Flowers,	1 00
John B. Moore & Son, Six Hybrid Perpetual Roses,	1 00
Jackson Dawson, Hellebores in variety,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	1 00

January 30.

Gratuities:—

Mrs. Francis B. Hayes, Cut Flowers,	2 00
Jackson Dawson, Lily of the Valley and *Andromeda Japonica*,	1 00

February 6.

Freesia Refracta.— Four pots in bloom, Mrs. A. D. Wood,	4 00
Roman Hyacinths.— Six six-inch pots, Edwin Fewkes,	4 00
Second, Mrs. E. M. Gill,	3 00

Gratuities:—

Mrs. A. D. Wood, Freesias in pots,	2 00
John B. Moore & Son, Roses,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	3 00
Mrs. E. M. Gill, " "	1 00

FEBRUARY 13.

Gratuities:—

Mrs. Francis B. Hayes, Cut Flowers,	$2 00
" " " " Roses,	1 00
" " " " *Eriostemon myrtifolium* and *E. microphyllum*,	1 00
Mrs. A. D. Wood, Vase of Flowers,	1 00

FEBRUARY 20.

Gratuities:—

Mrs. Francis B. Hayes, Orchids, Azaleas, and Cut Flowers,	5 00

FEBRUARY 27.

Gratuities:—

John B. Moore & Son, fourteen Hybrid Perpetual Roses,	2 00
Edwin Fewkes, five " " "	1 00
Mrs. Francis B. Hayes, two Roses in pots, Magna Charta and Emily Laxton,	2 00
Mrs. Francis B. Hayes, Cut Flowers,	3 00
C. M. Hovey, Cut Camellias,	2 00

MARCH 6.

Gratuities:—

Alfred W. Spencer, *Dendrobium Wardianum*,	2 00
Mrs. F. B. Hayes, Cut Flowers,	3 00
C. M. Hovey, Camellias,	2 00
Edwin Sheppard, Cinerarias and Cut Flowers,	2 00
James O'Brien, Cyclamens,	1 00
Jackson Dawson, fourteen varieties of Roses on Japan stock,	1 00
E. M. Wood & Co., Cornelia Cook Roses,	1 00
Norton Brothers, Baroness Rothschild Roses,	1 00
Mrs. E. M. Gill, Amaryllis and Cut Flowers,	1 00

MARCH 13.

Gratuities:—

Jackson Dawson, twelve Hybrid Perpetual Roses, on Japan stock,	5 00
John B. Moore & Son, Hybrid Perpetual Roses, Baroness and White Baroness,	2 00
Theodore N. Vail, twelve pots of Cinerarias,	2 00
C. M. Hovey, Camellias,	2 00
Mrs. Francis B. Hayes, Cut Flowers,	2 00

SPRING EXHIBITION.

MARCH 24, 25, AND 26.

INDIAN AZALEAS.—Six named varieties, in pots, Arthur W. Blake, ... $15 00
Second, Marshall P. Wilder, ... 12 00
Third, Arthur W. Blake, ... 10 00
Two named varieties, William Martin, gardener to Nathaniel T. Kidder, ... 6 00
Second, Arthur W. Blake, ... 4 00
Specimen Plant, named, William Martin, ... 5 00
Second, Arthur W. Blake, ... 4 00
Four named varieties, in not exceeding ten-inch pots, Arthur W. Blake, ... 10 00
Second, Marshall P. Wilder, ... 8 00
Third, Arthur W. Blake, ... 6 00
Single plant, of any named variety, in not over an eight-inch pot, Arthur W. Blake, ... 3 00
HYBRID PERPETUAL ROSES.—Three plants, distinct named varieties, Jackson Dawson, ... 8 00
Second, Mrs. Francis B. Hayes, ... 6 00
Single named plant, William Martin, ... 4 00
Second, Edwin Sheppard, ... 3 00
Six cut blooms, distinct named varieties, John B. Moore & Son, . 4 00
Second, Mrs. Francis B. Hayes, ... 3 00
TENDER ROSES IN VASES.—Twelve blooms of Bon Silène, Samuel Neil, ... 3 00
Twelve blooms of Catherine Mermet, W. H. Elliott, ... 5 00
Second, Edwin Sheppard, ... 4 00
Twelve blooms of Cornelia Cook, W. H. Elliott, ... 5 00
Second, N. S. Simpkins, ... 4 00
Twelve blooms of Maréchal Niel, W. H. Elliott, ... 5 00
Twelve blooms of Niphetos, Edwin Sheppard, ... 5 00
Second, Mrs. E. M. Gill, ... 4 00
Twelve blooms of Safrano, Samuel Neil, ... 3 00
Second, Edwin Sheppard, ... 2 00
Twelve blooms of Souvenir de la Malmaison, Edwin Sheppard, . 5 00
Second, Mrs. E. M. Gill, ... 4 00
ORCHIDS.—Six plants in bloom, Frederick L. Ames, ... 15 00
Second, David Allan, gardener to Robert M. Pratt, ... 12 00
Third, E. W. Gilmore, ... 10 00
Three plants in bloom, H. H. Hunnewell, ... 8 00
Second, David Allan, ... 6 00
Third, Frederick L. Ames, ... 5 00
Fourth, William Martin, ... 4 00

Single plant in bloom, David Allan,	$5 00
Second, Frederick L. Ames,	4 00
Third, Frederick L. Ames,	3 00
Fourth, E. W. Gilmore,	2 00
STOVE OR GREENHOUSE PLANT. — Specimen in bloom, other than Azalea or Orchid, named, H. H. Hunnewell,	6 00
HARDY FLOWERING SHRUBS AND HERBACEOUS PLANTS, FORCED.— Six in pots, six distinct varieties, C. M. Hovey,	10 00
CYCLAMENS.— Six pots in bloom, James O'Brien,	6 00
Second, Edwin Sheppard,	4 00
Three plants in bloom, Edwin Sheppard,	3 00
Second, James O'Brien,	2 00
Single plant in bloom, Edwin Sheppard,	2 00
HEATHS.— Three plants in bloom, the second prize to Mrs. F. B. Hayes,	3 00
PRIMROSES.— Double-flowered, the second prize to C. M. Hovey,	4 00
HARDY PRIMROSES OR POLYANTHUSES. — Six plants of distinct varieties, in bloom, Joseph Tailby,	4 00
Second, Edwin Fewkes,	3 00
CINERARIAS.—Six varieties, in bloom, in not over nine-inch pots, E. W. Gilmore,	8 00
Second, Edwin Sheppard,	6 00
Third, George Seaverns,	4 00
Single plant, in bloom, E. W. Gilmore,	3 00
Second, Edwin Sheppard,	2 00
VIOLETS.— Six pots, in bloom, William Martin,	4 00
Second, Samuel Neil,	3 00
Third, Edwin Sheppard,	3 00
PANSIES.—Six distinct varieties in pots, in bloom, Edwin Sheppard,	4 00
Second, William Ward,	3 00
Third, S. S. Hovey,	2 00
Fifty cut blooms, in the Society's flat fruit dishes, Edwin Sheppard,	3 00
Second, William Ward,	2 00
Third, S. S. Hovey,	1 00
AURICULAS.—Twelve in pots, in bloom, the second prize to David Allan,	4 00
CARNATIONS.— Display of cut blooms, not less than six varieties, in vases, J. A. Foster,	5 00
CAMELLIAS.— Display of named varieties, cut flowers with foliage, not less than twelve blooms, of not less than six varieties, C. M. Hovey,	5 00
Six cut blooms, of not less than four named varieties, with foliage, C. M. Hovey,	3 00
Second, C. M. Hovey,	2 00
CENTRE-PIECE FOR DINNER TABLE.— Best designed and best kept during the exhibition, W. A. Manda,	20 00

Second, James O'Brien,	$15 00
Third, Mrs. E. M. Gill,	12 00
Fourth, C. M. Hovey,	10 00

Special Prizes for Bulbs, offered by the General Union of Holland for the Promotion of the Cultivation of Bulbs.

HYACINTHS. — Fifty named bulbs, in fifty pots, forced in pots, not more than two of any one variety,

C. H. Hovey, the First Prize, a Gold Medal.

C. M. Hovey, the Second Prize, a Silver Gilt Medal.

C. H. Hovey, the Third Prize, a Silver Medal.

Society's Prizes.

HYACINTHS.— Twelve distinct named varieties, in pots, one in each pot, in bloom, William Martin,	$10 00
Second, Charles H. Hovey,	8 00
Third, C. M. Hovey,	6 00
Six distinct named varieties, in pots, one in each pot, in bloom, William Martin,	6 00
Second, Edwin Fewkes,	5 00
Third, C. M. Hovey,	4 00
Three distinct named varieties, in pots, one in each pot, in bloom, C. M. Hovey,	4 00
Second, William Martin,	3 00
Third, Charles H. Hovey,	2 00
Single named bulb, in pot, in bloom, C. M. Hovey,	2 00
Second, Charles H. Hovey,	1 00
Three pans, ten bulbs of one variety in each pan, William Martin,	6 00
Second, William Martin,	4 00
Third, C. M. Hovey,	3 00
TULIPS.— Six six-inch pots, six bulbs in each, in bloom, C. M. Hovey,	5 00
Second, Charles H. Hovey,	4 00
Third, William Martin,	3 00
Three six-inch pots, six bulbs in each, in bloom, C. H. Hovey,	4 00
POLYANTHUS NARCISSUS.— Four seven-inch pots, three bulbs in each, in bloom, Charles H. Hovey,	6 00
Second, C. M. Hovey,	4 00
HARDY NARCISSUS AND DAFFODILS.— Best display, C. M. Hovey,	8 00
JONQUILS.— Four six-inch pots, six bulbs in each, in bloom, Charles H. Hovey,	3 00
GENERAL DISPLAY OF SPRING BULBS.— C. M. Hovey,	15 00
LILY OF THE VALLEY.— Six six-inch pots, in bloom, Jackson Dawson,	6 00
Second, C. M. Hovey,	4 00
Third, Edward L. Beard,	3 00

ANEMONES.—Three pans, Jackson Dawson, ... $4 00
Second, Jackson Dawson, ... 3 00

Gratuities:—

W. A. Manda, Herbaceous Plants, forced, ... 25 00
" " " *Primula obconica*, ... 5 00
" " " Orchids, ... 5 00
David Allan, Ferns, Cut Flowers, and Orchids, ... 15 00
Arthur W. Blake, Display of Azaleas, ... 10 00
Frederick L. Ames, Orchids and Cut Flowers, ... 10 00
H. H. Hunnewell, Plants and Cut Flowers, ... 10 00
Miss Sarah W. Story, Table Design, ... 5 00
C. M. Hovey, Azaleas and Pelargoniums, ... 10 00
Mrs. Francis B. Hayes, General Display of Flowers and Plants, . 8 00
" " " " *Cocos Weddelliana*, ... 3 00
E. W. Gilmore, elegant arrangement of flowering plants, . . 5 00
" " " six Calceolarias, ... 4 00
Jackson Dawson, Azaleas, Primroses, and forced Shrubs . . 3 00
John B. Moore & Son, three vases of Roses, ... 3 00
N. S. Simpkins, three pots of English Primroses, ... 2 00
C. M. Hovey, *Gesnera macrantha*, ... 1 00
Arthur H. Fewkes, Collection of Narcissus, ... 2 00
S. S. Hovey, Cut Flowers, ... 1 00
Edwin Sheppard, " " 1 00
George Seaverns, " " 1 00
Mrs. P. D. Richards, Native Plants and Mosses, ... 1 00

APRIL 8.

Gratuities:—

Frederick L. Ames, *Dendrobium chrysotozum superbum*, . . . 3 00
Robert Blair, gardener to Alfred W. Spencer, *Dendrobium chrysotozum*, ... 1 00
Mrs. F. B. Hayes, Rhododendrons and other Cut Flowers, . . 3 00
C. M. Hovey, Cut Camellias, ... 2 00
Miss Sarah W. Story, Cut Flowers, ... 1 00
Edwin Fewkes, four pots of Tulips, ... 1 00

APRIL 10.

Gratuities:—

W. A. Manda, pans of Forced Hardy Plants, ... 3 00
C. M. Hovey, Camellias, ... 1 00

APRIL 17.

Gratuities:—

Robert T. Jackson, twenty-four bottles of Polyanthus Primroses, . 1 00
Edwin Sheppard, Pelargoniums, etc., ... 1 00
E. H. Hitchings, Native Plants, ... 1 00

APRIL 24.

Gratuities:—

C. M. Hovey, three pots of Azaleas,	$1 00
Mrs. Francis B. Hayes, Rhododendron Countess of Haddington,	1 00
Miss Anna C. Kenrick, *Magnolia conspicua*,	1 00
Mrs. P. D. Richards, Native Flowers,	1 00

MAY 1.

Gratuities:—

Miss Sarah W. Story, Cut Flowers,	1 00
Mrs. E. M. Gill, " "	1 00

MAY EXHIBITION.

MAY 8.

PELARGONIUMS.—Four named Show or Fancy varieties, in pots, Charles M. Hovey,	$8 00
Second, Charles M. Hovey,	6 00
Six named Zonale varieties, " " "	8 00
Second, " " "	6 00
INDIAN AZALEAS.—Three plants, in pots, named, the second prize to Charles M. Hovey,	5 00
Third, " " "	4 00
HARDY BULBS.—Collection of blooms, C. M. Hovey,	5 00
Second, Joseph H. Woodford,	4 00
BASKET OF FLOWERS.—Mrs. E. M. Gill,	6 00
PANSIES.—Fifty cut blooms, in the Society's flat fruit dishes, Mrs. E. M. Gill,	4 00
Second, Joseph H. Woodford,	3 00
Third, Edwin Sheppard,	2 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, Mrs. L. P. Weston,	2 00
Second, J. W. Manning,	1 00

Gratuities:—

David Allan, Orchids,	3 00
" " Auriculas,	3 00
William Martin, Gloxinias,	2 00
Robert Manning, *Trillium grandiflorum*,	1 00
W. A. Manda, Collection of Herbaceous Plants and Shrubs,	5 00
Edwin Sheppard, Cut Pelargoniums,	2 00
Mrs. Francis B. Hayes, Cut Flowers,	2 00
Miss Sarah W. Story, " "	2 00
Mrs. L. P. Weston, " "	1 00
J. H. Woodford, " "	1 00
Mrs. P. D. Richards, Wild "	3 00
C. W. Sanderson, " "	1 00
E. H. Hitchings, Native Plants and Flowers,	1 00

MAY 15.

Gratuities:—

W. A. Manda, Shrubs and Herbaceous Plants,	$3 00
J. W. Manning, Herbaceous Plants,	2 00
Mrs. E. M. Gill, Pansies and Cut Flowers,	2 00
Mrs. L. P. Weston, Cut Flowers, Wild Flowers, and Shrubs,	2 00
Mrs. Francis B. Hayes, Flowering Apples and Roses,	1 00
Miss Anna C. Kenrick, three kinds of Magnolias,	1 00
Mrs. E. S. Joyce, Cut Flowers,	1 00
E. H. Hitchings, Wild Flowers,	2 00

MAY 22.

Gratuities:—

W. A. Manda, Cactus and other Cut Flowers,	3 00
J. W. Manning, Hardy Shrubs, named,	2 00
Jackson Dawson, nine (two new) Syringas,	1 00
Edwin Sheppard, thirteen Tulips, named,	1 00
Miss Sarah W. Story, Hardy Shrubs,	1 00
Mrs. L. P. Weston, Cut Flowers,	2 00
Joseph H. Woodford, " "	1 00
Mrs. E. M. Gill, " " and Pansies	1 00
E. H. Hitchings, Native Flowers,	3 00
Mrs. P. D. Richards, " "	2 00

MAY 29.

Gratuities:—

H. H. Hunnewell, Cut Flowers of named Rhododendrons,	5 00
Mrs. Francis B. Hayes, Cut Blooms and Foliage of Trees and Shrubs,	5 00
Marshall P. Wilder, two Seedling Pæonies,	2 00
W. A. Manda, Hardy Perennials,	2 00
J. W. Manning, " "	1 00
Joseph H. Woodford, Clematis,	2 00
E. H. Hitchings, Native Flowers,	2 00

RHODODENDRON SHOW.

JUNE 5.

RHODODENDRONS.— Twenty-four tender varieties, named, Mrs. Francis B. Hayes,	10 00
Twelve tender varieties, named, Mrs. Francis B. Hayes,	6 00
Six " " " " " " "	3 00
Three " " " " " " "	2 00
Single truss of any tender variety, named, Mrs. Francis B. Hayes,	1 00

Eighteen hardy varieties, named, Mrs. Francis B. Hayes,	$10 00
Second, C. M. Hovey,	6 00
Six hardy varieties, named, the second prize to C. M. Hovey,	2 00
Single truss of any hardy variety, named, Mrs. Francis B. Hayes,	1 00
HARDY AZALEAS.—Fifteen named varieties, one truss each, Mrs. Francis B. Hayes,	8 00
Second, Edwin Sheppard,	5 00
Twelve named varieties, C. M. Hovey,	5 00
Cluster of trusses, of one variety, C. M. Hovey,	2 00
Second, C. M. Hovey,	1 00

Society's Prizes.

TREE PÆONIES.—Six named varieties, Marshall P. Wilder,	3 00
GERMAN IRIS.—Six distinct varieties, Arthur H. Fewkes,	3 00
Second, J. W. Manning,	2 00
CLEMATIS.—Named varieties, cut blooms, J. H. Woodford,	4 00
Second, J. H. Woodford,	3 00
HARDY FLOWERING TREES AND SHRUBS.—Largest and best collection, named, cut blooms, J. W. Manning,	5 00
NATIVE PLANTS.—Display of named species and varieties, one bottle of each, Mrs. P. D. Richards,	4 00
Second, E. H. Hitchings,	3 00
CUT FLOWERS.—Display filling one hundred bottles, Mrs. A. D. Wood,	4 00
Second, Mrs. L. P. Weston,	3 00
Third, Mrs. E. M. Gill,	2 00
HERBACEOUS PLANTS.—Mrs. L. P. Weston,	2 00
Second, J. W. Manning,	1 00

Gratuities:—

W. A. Manda, Display of Plants and Flowers,	15 00
Mrs. Francis B. Hayes, Rhododendrons and Azaleas,	10 00
Edward L. Beard, *Cattleya Mendelii*,	8 00
Jackson Dawson, Shrubs,	3 00
C. M. Hovey, Rhododendrons, etc.,	2 00
J. S. Richards, "	1 00
William H. Spooner, Perpetual Scotch Roses,	1 00
Arthur H. Fewkes, Iris and Aquilegias,	1 00
Edwin Sheppard, Cut Flowers,	3 00
Miss Ellen M. Harris, " "	2 00
L. W. Goodell, " "	1 00
Joseph H. Woodford, Vase of Flowers,	1 00

JUNE 12.

Gratuities:—

Mrs. Francis B. Hayes, Rhododendrons,	5 00
H. H. Hunnewell, "	5 00

Jackson Dawson, Hardy Flowering Shrubs,	$5 00
William H. Spooner, Cut Blooms of Roses,	3 00
Warren Heustis, " " "	2 00
Benjamin G. Smith, " " "	1 00
John S. Richards, " " "	1 00
Miss Ellen M. Harris, Pæonies, etc.,	1 00
Joseph H. Woodford, Clematis, etc.,	1 00
John C. Hovey, Pyrethrums,	1 00
J. W. Manning, Hardy Perennials,	1 00
W. A. Manda, Cut Flowers,	2 00
Miss Sarah W. Story, " "	2 00
Mrs. L. P. Weston, " "	2 00
Mrs. E. M. Gill, " "	2 00
Mrs. A. D. Wood, " "	2 00
Mrs. E. S. Joyce, " "	1 00
E. H. Hitchings, Native Flowers,	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

Special Prize, Offered by a Member of the Society.

HYBRID PERPETUAL ROSES.— Best twelve blooms of Merveille de Lyon, Warren Heustis, ... $10 00

Special Prizes.

HYBRID PERPETUAL ROSES.—Twenty-four of different varieties, David Allan, gardener to Robert M. Pratt, Silver Vase, value, 30 00
Second, John S. Richards, Silver Vase, value, ... 15 00
Twelve Roses, of different varieties, named, John L. Gardner, Silver Vase, value, ... 15 00
Eighteen Roses, of different varieties, named, John S. Richards, Silver Vase, value, ... 25 00
Eighteen Roses of any six varieties, three of each, John B. Moore & Son, Silver Vase, value, ... 25 00
General Display of Roses, grown in open culture, all classes except Hybrid and Moss, Charles M. Hovey, Silver Vase, value, 15 00
Best and best kept design of Roses, in receptacles other than vases, Joseph H. Woodford, Silver Vase, value, . . . 18 00
Amateurs' Prize, Twenty-four named roses, J. L. Gardner, Silver Vase, value, ... 30 00
Second, John S. Richards, Silver Vase, value, ... 15 00
Six blooms of Alfred Colomb, David Allan, ... 4 00
Second, John B. Moore & Son, ... 3 00
Six blooms of Baroness Rothschild, David Allan, ... 4 00
Second, Mrs. Francis B. Hayes, ... 3 00

Six blooms of John Hopper, Mrs. Francis B. Hayes,	$4 00
Second, John B. Moore & Son,	3 00
Six blooms of Marquise de Castellane, the second prize to John B. Moore & Son,	3 00
Six blooms of Merveille de Lyon, William H. Spooner,	4 00
Six blooms of Madame G. Luizet, Mrs. Francis B. Hayes,	4 00
Second, David Allan,	3 00
Six blooms of Victor Verdier, John B. Moore & Son,	4 00
Twelve blooms of any other variety, John B. Moore & Son,	6 00
Second, David Allan,	4 00

Regular Prizes.

HARDY PERPETUAL ROSES.—Best six new varieties sent out since 1882, the second prize to William H. Spooner,	4 00
Seventy-two blooms, not less than eighteen varieties, John B. Moore & Son,	20 00
Second, Warren Heustis,	15 00
Thirty-six blooms, not less than ten varieties, John S. Richards,	10 00
Second, John B. Moore & Son,	8 00
Six distinct named varieties, three of each, William H. Spooner,	8 00
Second, John S. Richards,	6 00
Three distinct named varieties, three of each, John S. Richards,	4 00
Second, Mrs. Francis B. Hayes,	3 00
MOSS ROSES.—Six named varieties, three clusters of each, John B. Moore & Son,	6 00
Three named varieties, three clusters of each, Edwin Fewkes,	4 00
Second, John B. Moore & Son,	3 00
Third, William H. Spooner,	2 00
HYBRID TEA ROSES.—Display in boxes, John S. Richards,	6 00
Second, Warren Heustis,	4 00
GENERAL DISPLAY of Hardy Roses, filling one hundred bottles, William H. Spooner,	10 00
Second, John S. Richards,	9 00
Third, John B. Moore & Son,	8 00
Fourth, Edwin Fewkes,	7 00
Fifth, Benjamin G. Smith,	6 00
STOVE AND GREENHOUSE FLOWERING PLANTS.—Five distinct named varieties, in bloom, not Orchids, John L. Gardner,	15 00
SPECIMEN PLANT IN BLOOM.—Named, other than Orchid, John L. Gardner, *Rhyncospermum jasminoides*,	6 00
SPECIMEN FOLIAGE OR FLOWERING PLANT, new and rare, other than Orchid, Frederick L. Ames, *Dracæna Lindeni*,	4 00
Second, C. M. Hovey, " "	3 00
ORCHID.—Twelve plants, named varieties, in bloom, Frederick L. Ames,	18 00
Second, David Allan,	15 00

Six plants, named, David Allan, ... $10 00
Second, Frederick L. Ames, ... 8 00
Third, Thomas Greaves, ... 6 00
Single specimen, Frederick L. Ames, *Lælia purpurata*, . . 6 00
Second, Thomas Greaves, *Cattleya Mendelii*, ... 5 00
HERBACEOUS PÆONIES.—Ten named varieties, John C. Hovey, . 6 00
Second, Marshall P. Wilder, ... 5 00
SWEET WILLIAMS.—Thirty trusses, not less than six distinct varieties, Edwin Sheppard, ... 3 00
Second, L. W. Goodell, ... 2 00
Third, Edwin Fewkes, ... 1 00
VASE OF FLOWERS.—Best arranged, Mrs. E. M. Gill, . . . 5 00
Second, Mrs. A. D. Wood, ... 4 00
Third, Miss Sarah W. Story, ... 3 00
HERBACEOUS PLANTS.—J. W. Manning, ... 2 00

Gratuities:—

David Allan, Orchids, Ferns, Palms, and Cut Flowers, . . . 15 00
Frederick L. Ames, Orchids, Ferns, Palms, and Cut Flowers, . 10 00
W. A. Manda, Orchids and Stove Plants, ... 10 00
" " " Display of Plants and Flowers, ... 5 00
John L. Gardner, Ericas and Pelargoniums, ... 3 00
Edwin Sheppard, Delphiniums, etc., ... 3 00
" " Roses, ... 2 00
Mrs. E. M. Gill, " 2 00
John S. Richards, " 2 00
O. B. Hadwen, " 1 00
Robert Manning, *Actinidia polygama*, ... 1 00
Denys Zirngiebel, *Delphinium Breckii*, etc., ... 1 00
John L. Gardner, *Iris Kæmpferi*, ... 1 00
Charles M. Hovey, Kalmias, etc., ... 1 00
" " " Hydrangea, ... 1 00
Robert T. Jackson, Plants and Flowers, ... 1 00
Mrs. E. M. Gill, Basket of Flowers, ... 3 00
Miss Sarah W. Story, Display of Cut Flowers, ... 3 00
Mrs. A. D. Wood, " " " " 2 00
Mrs. L. P. Weston, " " " " 2 00
Thomas Greaves, " " " " 2 00
E. H. Hitchings, Native Flowers, ... 3 00
Mrs. P. D. Richards, " " 3 00
Miss Mary L. Vinal, " " and Grasses, ... 1 00

JULY 3.

HYBRID PERPETUAL ROSES.—Twenty-four blooms, twenty-four distinct named varieties, in vases, John B. Moore & Son, . . 4 00
Second, John S. Richards, ... 3 00

Delphiniums.—Six named varieties, Edwin Fewkes & Son,	$4 00
Second, Edwin Fewkes & Son,	3 00
Third, Anthony McLaren,	2 00
Lilium Candidum.—Twelve spikes, Benjamin G. Smith,	3 00
Second, Joseph H. Woodford,	2 00
Cut Flowers.—Display, filling one hundred bottles, Mrs. E. M. Gill,	4 00
Second, Mrs. Francis B. Hayes,	3 00
Third, William K. Wood,	2 00
Herbaceous Plants.—J. W. Manning,	2 00
Second, Mrs. L. P. Weston,	1 00

Gratuities:—

Mrs. Francis B. Hayes, one hundred and forty Hybrid Perpetual Roses,	5 00
Warren Heustis & Son, fifty Hybrid Perpetual Roses,	2 00
J. W. Manning, Japan Iris, etc.,	1 00
Edwin Fewkes & Son, " "	1 00
Charles M. Hovey, Native Rhododendrons,	1 00
Joseph H. Woodford, Grasses,	1 00
Mrs. L. P. Weston, Cut Flowers, one hundred bottles,	2 00
Edwin Sheppard, Cut Flowers,	2 00
Mrs. E. S. Joyce, " "	1 00
Frank C. Hyde, Wild Flowers,	1 00
Mrs. P. D. Richards, Native Flowers,	2 00

July 10.

Japan Iris (Varieties of *Iris Kæmpferi*).—Best collection, John L. Gardner,	8 00
Second, Edwin Fewkes & Son,	6 00
Third, J. F. C. Hyde,	5 00
Six named varieties, Edwin Fewkes & Son,	4 00
Vase of Flowers.—Best arranged, Miss S. W. Story,	3 00
Second, Mrs. E. M. Gill,	2 00
Herbaceous Plants.—J. W. Manning,	2 00
Second, Mrs. L. P. Weston,	1 00

Gratuities:—

John B. Moore & Son, Hybrid Perpetual Roses,	1 00
Mrs. L. P. Weston, Cut Flowers,	1 00
Miss Ellen M. Harris, " "	1 00
Mrs. E. S. Joyce, " "	1 00
Miss Sarah W. Story, " "	1 00
Edwin Sheppard, " "	1 00
Jackson Dawson, Hardy Summer Flowering Shrubs,	2 00
Severance Burrage, Native Flowers, eighty species,	2 00
Frank C. Hyde, " "	1 00

JULY 17.

HOLLYHOCKS, DOUBLE. — Twelve blooms, twelve distinct colors,
Edwin Sheppard, ... $4 00
Second, Edwin Fewkes & Son, ... 3 00
Six blooms, six distinct colors, J. F. C. Hyde, ... 2 00
Second, Charles M. Hovey, ... 1 00
CUT FLOWERS.—Display of one hundred bottles, Charles M. Hovey, 4 00
Second, Mrs. E. M. Gill, ... 3 00
Third, William K. Wood, ... 2 00
HERBACEOUS PLANTS.—J. W. Manning, ... 2 00
Second, Mrs. L. P. Weston, ... 1 00

Gratuities:—

Edwin Sheppard, Hollyhocks, ... 2 00
Miss Ellen M. Harris, " 1 00
George Seaverns, " 1 00
Charles F. Curtis, " 1 00
John L. Gardner, Cypripediums, Gloxinia, and Heath, named, . 3 00
C. M. Hovey, *Aerides odorata* and *Hydrangea gymnoclada*, . . 1 00
W. A. Manda, Cut Flowers, Display, ... 2 00
Mrs. L. P. Weston, " " one hundred bottles, . . . 2 00
Mrs. E. S. Joyce, " " 1 00
Edwin Fewkes & Son, " " 1 00
Miss Sarah W. Story, " " 1 00
Frank C. Hyde, Native Flowers, one hundred varieties, . . 1 00
Mrs. P. D. Richards, " " 1 00

JULY 24.

HYDRANGEAS.—Two plants of different varieties, in tubs or pots,
John L. Gardner, ... 5 00
PELARGONIUMS.—Six double and six single varieties, named, one truss of each, C. M. Hovey, ... 2 00
Second, Mrs. E. M. Gill, ... 1 00
PERENNIAL PHLOXES.—Six distinct named varieties, one spike of each, Edwin Fewkes & Son, ... 3 00
Second, Edwin Sheppard, ... 2 00
VERBENAS.—Thirty bottles, one truss in each, Isaac E. Coburn, . 3 00
Second, C. M. Hovey, ... 2 00
SWEET PEAS.—Display of twenty-five bottles, J. F. C. Hyde, . . 3 00
Se cond, William P. Martin, ... 2 00
Third, Marshall B. Faxon, ... 1 00
HERBACEOUS PLANTS.—J. W. Manning, ... 2 00
Second, Mrs. L. P. Weston, ... 1 00

Gratuities:—

Frederick L. Ames, Orchids, ... 5 00
David Allan, " 2 00

Edwin Sheppard, Hollyhocks,	$2 00
C. M. Hovey, Eugenia and Hedychium,	1 00
Joseph H. Woodford, Sweet Peas,	1 00
J. W. Manning, Flowering Shrubs,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	3 00
Mrs. L. P. Weston, " "	2 00
Miss Sarah W. Story, " "	1 00
W. A. Manda, " "	1 00
Mrs. P. D. Richards, Wild Flowers,	2 00
Miss Mary L. Vinal, " "	1 00

JULY 31.

STOCKS.—Six varieties, one cut plant of each, Edwin Sheppard,	3 00
CUT FLOWERS.—Display, filling one hundred bottles, Mrs. E. M. Gill,	4 00
Second, C. M. Hovey,	3 00
Third, William K. Wood,	2 00
NATIVE FLOWERS.—Mrs. P. D. Richards,	3 00
Second, Severance Burrage,	2 00
HERBACEOUS PLANTS.—J. W. Manning,	2 00
Second, Mrs. L. P. Weston,	1 00

Gratuities:—

W. A. Manda, Stove and Greenhouse Herbaceous Plants and Ferns,	5 00
Severance Burrage, Native Flowers, ninety varieties,	2 00
Frank C. Hyde, " " seventy-eight varieties,	2 00
Mrs. P. D. Richards, " "	1 00
Miss Mary L. Vinal, " "	1 00
E. H. Hitchings, " "	1 00
Jackson Dawson, Hardy Hypericums and Heaths,	1 00
George Seaverns, Princess Beatrice Sweet Peas,	1 00
Edwin Fewkes & Son, Dahlias and Hollyhocks,	1 00
Mrs. E. S. Joyce, Cut Flowers,	1 00
Mrs. L. P. Weston, " "	1 00
Miss Sarah W. Story " "	1 00
Edwin Sheppard, " "	1 00

AUGUST 7.

PERENNIAL PHLOXES.—Ten distinct named varieties, one spike each, Edwin Sheppard,	3 00
Second, Edwin Fewkes & Son,	2 00
PETUNIAS.—Collection, filling thirty bottles, one spray in each, Edwin Fewkes & Son,	3 00
Second, H. B. Watts,	2 00
Third, L. W. Goodell,	1 00

CUT FLOWERS.—Display, filling one hundred bottles, Mrs. E. M. Gill,	$4 00
Second, C. M. Hovey,	3 00
Third, William K. Wood,	2 00
NATIVE FLOWERS.—Collection, Severance Burrage,	3 00
Second, Mrs. P. D. Richards,	2 00
HERBACEOUS PLANTS.—J. W. Manning.	2 00
Second, Mrs. L. P. Weston,	1 00

Gratuities:—

C. M. Hovey, Pelargoniums,	1 00
Edwin Fewkes & Son, Dahlias,	1 00
W. A. Manda, Cut Flowers,	3 00
Mrs. L. P. Weston, " "	1 00
Miss. S. W. Story, " "	1 00
L. W. Goodell, " "	1 00
H. B. Watts, " "	1 00
Edwin S. Hill, " "	1 00
E. H. Hitchings, Native Flowers,	1 00

AUGUST 14.

GLADIOLI.—Twenty named varieties, in spikes, James Cartwright,	10 00
Second, H. B. Watts,	8 00
Ten named varieties, in spikes, Edwin Sheppard	6 00
Six named varieties, in spikes, F. Bacheller,	5 00
Second, H. B. Watts,	3 00
Single spike, named, H. B. Watts,	1 00
Display of named and unnamed varieties, filling one hundred bottles, James Cartwright,	8 00
Second, H. B. Watts,	6 00
Third, Edwin Sheppard,	4 00
PHLOX DRUMMONDI.—Fifty bottles, not less than six varieties, Edwin Sheppard,	2 00
Second, A. A. Hixon,	1 00
HERBACEOUS PLANTS.—J. W. Manning,	2 00
Second, Mrs. L. P. Weston,	1 00

Gratuities:—

Frederick L. Ames, Orchids, etc.,	2 00
Warren Heustis & Son, Roses,	2 00
Edwin Fewkes & Son, Dahlias,	1 00
George S. Tuttle, " (Pompon),	1 00
E. W. Sewall, Poppies,	1 00
C. M. Hovey, Pelargoniums,	1 00

Mrs. Francis B. Hayes, Cut Flowers,	$3 00
Mrs. E. M. Gill, " "	2 00
Miss Sarah W. Story, " "	2 00
William K. Wood, " "	2 00
W. A. Manda, " "	2 00
A. A. Nixon, " "	1 00
Edwin S. Hill, " "	1 00
John Parker, " "	1 00
Mrs. L. P. Weston, " "	1 00
William Martin, " "	1 00
E. H. Hitchings, Native Flowers,	2 00

AUGUST 21.

ASTERS.—Truffaut's Pæony Flowered, thirty blooms, not less than three varieties, Marshall B. Faxon,	5 00
Second, L. W. Goodell,	4 00
Third, James O'Brien,	3 00
Victoria Flowered, thirty blooms, not less than eight varieties, Marshall B. Faxon,	5 00
Second, John L. Gardner,	4 00
Third, James O'Brien,	3 00
Pompon, thirty sprays, not less than six varieties, one spray in each bottle, L. W. Goodell,	4 00
Second, Marshall B. Faxon,	3 00
BASKET OF FLOWERS.—Best arranged, James O'Brien,	4 00
Second, Mrs. A. D. Wood,	3 00
Third, Mrs. E. M. Gill,	2 00
HERBACEOUS PLANTS.—J. W. Manning,	2 00
Second, Mrs. L. P. Weston,	1 00

Gratuities:—

Marshall B. Faxon, Display of Asters,	8 00
James Cartwright, Gladioli,	2 00
H. B. Watts, "	2 00
E. Fewkes & Son, Dahlias,	1 00
C. W. Hoitt, "	1 00
George S. Tuttle, " (Pompon),	1 00
John C. Hovey, *Amaryllis Hallii*,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	2 00
Mrs. L. P. Weston, " "	2 00
W. A. Manda, " "	2 00
John Parker, " "	1 00
Miss Sarah W. Story, " "	1 00
Mrs. E. M. Gill, " "	1 00
Mrs. Anna D. Wood, " "	1 00
Warren Heustis & Son, " "	1 00

Mrs. P. D. Richards, Wild Flowers, ... $1 00
E. H. Hitchings, " " 1 00
Frank C. Hyde, " " 1 00

AUGUST 28.

LILIUM LANCIFOLIUM.—Twelve spikes, Herbert Gleason, . . 3 00
Second, Mrs. E. M. Gill, ... 2 00
TROPÆOLUMS.—Display, filling twenty-five bottles, Marshall B. Faxon, ... 3 00
Second, Mrs. E. M. Gill, ... 2 00
Third, Horace Eaton, ... 1 00
MARIGOLDS.—Twenty-five bottles, three flowers in each, the second prize to C. M. Hovey, ... 2 00
Third, Mrs. E. M. Gill, ... 1 00
HERBACEOUS PLANTS.—J. W. Manning, ... 2 00
Second, Mrs. L. P. Weston, ... 1 00

Gratuities:—

J. W. Clark, Seedling Gladioli, ... 3 00
H. B. Watts, Gladioli, ... 2 00
Edwin Sheppard, Gladioli, Dahlias, and Asters, ... 3 00
John L. Gardner, two Orchids, ... 1 00
O. M. Holmes, *Nelumbium luteum*, ... 1 00
Warren Heustis, Roses, ... 1 00
George S. Tuttle, Pompon Dahlias, ... 1 00
W. A. Manda, Nasturtiums and Marigolds, ... 1 00
Mrs. Francis B. Hayes, Cut Flowers, ... 2 00
Marshall B. Faxon, " " 2 00
William K. Wood, " " 1 00
John Parker, " " 1 00
Mrs. E. M. Gill, " " 1 00
Mrs. L. P. Weston, " " 1 00
Miss Sarah W. Story, " " 1 00
Edwin S. Hill, " " 1 00
Mrs. P. D. Richards " " 1 00
Frank Hyde, " " 1 00

SEPTEMBER 4.

DOUBLE ZINNIAS.—Twenty-five flowers, not less than six varieties, Edwin Sheppard, ... 3 00
Second, James O'Brien, ... 2 00
Third, L. W. Goodell, ... 1 00
DIANTHUS.—Annual and biennial varieties, collection filling fifty bottles, single trusses, L. W. Goodell, ... 4 00
Second, H. B. Watts, ... 3 00
Third, James O'Brien, ... 2 00

CUT FLOWERS.—Display filling one hundred bottles, James O'Brien, $4 00
Second, William K. Wood, ... 3 00
Third, Mrs. E. M. Gill, ... 2 00
HERBACEOUS PLANTS.—J. W. Manning, ... 2 00
Second, Mrs. L. P. Weston, ... 1 00

Gratuities:—

W. A. Manda, Annuals, ... 3 00
Edwin Fewkes & Son, Dahlias, etc., ... 2 00
Warren Heustis & Son, Asters, ... 2 00
Mrs. Francis B. Hayes, Roses, etc., ... 2 00
George S. Tuttle, Dahlias, ... 1 00
John Parker, " 1 00
Mrs. Starkes Whiton, " 1 00
H. B. Watts, cut spikes of Hardy Gladioli, ... 1 00
Marshall B. Faxon, Cut Flowers, ... 1 00
Miss Sarah W. Story, " " 1 00
Edwin Sheppard, " " 1 00
Mrs. L. P. Weston, " " 1 00
Edwin S. Hill, " " 1 00
John Parker, " " 1 00
Mrs. P. D. Richards, Solidagos and Asters, ... 2 00
Severance Burrage, Wild Flowers, ... 1 00
Frank C. Hyde, " " 1 00

ANNUAL EXHIBITION.

SEPTEMBER 14, 15, 16, AND 17.

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS.—Display in pots of other than Native Evergreens of New England, named, William C. Strong, ... $8 00

Society's Prizes.

GREENHOUSE PLANTS.—Six Greenhouse and Stove Plants, of different named varieties, one Croton admissible, Samuel R. Payson, ... 40 00
Second, Frederick L. Ames, ... 30 00
Third, G. A. Nickerson, ... 25 00
Fourth, William Martin, gardener to Nathaniel T. Kidder, . 20 00
SPECIMEN FLOWERING PLANTS.—Three named varieties, in bloom, David Allan, ... 15 00
Second, Frederick L. Ames, ... 10 00
Third, David Allan, ... 8 00

Single specimen, named, not offered in any collection, F. L. Ames,	$5 00
Second, David Allan,	4 00
Third, William Martin,	3 00
VARIEGATED LEAVED PLANTS.—Six named varieties, not offered in the collection of greenhouse plants, Crotons and Dracænas not admissible, Frederick L. Ames,	12 00
Second, William Martin,	10 00
Third, C. M. Hovey,	8 00
Single specimen, named, not offered in any collection, G. A. Nickerson,	5 00
Second, G. A. Nickerson,	4 00
Third, John L. Gardner,	3 00
CALADIUMS.—Four named varieties, William Martin,	5 00
FERNS.—Six named varieties, no Adiantums admissible, Frederick L. Ames,	8 00
Second, David Allan,	6 00
Third, G. A. Nickerson,	4 00
ADIANTUMS.—Six named varieties, Frederick L. Ames,	6 00
Second, William Martin,	4 00
TREE FERN.—Single specimen, named, C. M. Hovey,	6 00
Second, G. A. Nickerson,	4 00
LYCOPODS.—Four named varieties, William Martin,	3 00
Second, David Allan,	2 00
DRACÆNAS.—Six named varieties, H. H. Hunnewell,	8 00
Second, E. W. Gilmore,	6 00
CROTONS.—Six named varieties, in not exceeding six-inch pots, E. W. Gilmore,	6 00
Second, Frederick L. Ames,	4 00
Third, David Allan,	3 00
PALM.—Single specimen, named, G. A. Nickerson,	6 00
NEPENTHES.—Three plants, named, Samuel R. Payson,	6 00
ORCHIDS.—Six plants, named varieties, in bloom, Frederick L. Ames,	12 00
Second, E. W. Gilmore,	10 00
Third, David Allan,	8 00
Three plants, named varieties, in bloom, David Allan,	8 00
Second, Frederick L. Ames,	6 00
Single plant, in bloom, Frederick L. Ames,	5 00
Second, C. M. Hovey,	4 00
Third, David Allan,	3 00
GLADIOLI.—Best display, and best kept during the exhibition, filling one hundred bottles, H. B. Watts,	10 00
DAHLIAS.—Twelve named varieties, Edwin Sheppard,	4 00
Second, John Parker,	3 00
Six named varieties, Edwin Sheppard,	3 00
Second, Mrs. Starkes Whiton,	2 00
Three named varieties, Edwin Sheppard,	2 00
Second, Macey Randall,	1 00

Liliputian Dahlias.—General display, filling twenty-five bottles, G. S. Tuttle,	$3 00
Second, Macey Randall,	2 00
Third, Edwin Sheppard,	1 00
Cut Flowers.—Best display, and best kept during the exhibition, filling one hundred and fifty bottles, Mrs. E. M. Gill,	16 00
Second, C. M. Hovey.	14 00
Third, William K. Wood,	12 00
Basket of Flowers.—Best arranged, and best kept through the exhibition, James O'Brien,	8 00
Second, Mrs. A. D. Wood,	6 00
Third, Mrs. E. M. Gill,	5 00
Fourth, Miss Sarah W. Story,	4 00

Gratuities:—

N. S. Simpkins, Collection of Nymphæas,	20 00
W. A. Manda, Collection of Plants,	25 00
John L. Gardner, " " "	10 00
H. H. Hunnewell, " " "	5 00
W. A. Manda, " " Ferns,	10 00
David Allan, Gloxinias and Ferns,	5 00
William C. Strong, Variegated Leaved Trees and Plants,	3 00
J. W. Manning, Herbaceous Plants,	2 00
Marshall B. Faxon, Pansies,	2 00
Edwin Sheppard, Cut Flowers,	5 00
George Seaverns, " "	5 00
Mrs. F. B. Hayes, " "	3 00
John Parker, " "	2 00
Mrs. P. D. Richards, Wild Flowers,	3 00

October 2.

Gratuities:—

Marshall B. Faxon, Pansies,	1 00
L. H. Farlow, *Odontoglossum grande*,	1 00
John Parker, Dahlias,	1 00
Edwin Sheppard, "	1 00
W. H. Spooner, Moss Rose Salet,	1 00
Mrs. E. M. Gill, Cut Flowers,	1 00
Mrs. P. D. Richards, Wild Flowers,	1 00
Walter E. Coburn, " "	1 00

October 23.

Gratuity:—

E. W. Wood, Chrysanthemum Alexandre Dufour	1 00

October 30.

Gratuity:—

Mrs. Francis B. Hayes, Cut Flowers,	1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 10, 11, AND 12.

CHRYSANTHEMUMS.—Six Large Flowered, or Chinese, distinct named varieties, one plant in each pot, the third prize to John W. Scott, gardener to George A. James,	$10 00
Six Japanese, distinct named varieties, one plant in each pot, Edwin Fewkes & Son,	16 00
Second, E. A. Wood,	13 00
Third, William Martin, gardener to Nathaniel T. Kidder,	10 00
Four Pompons, distinct named varieties, one plant in each pot, P. Malley,	10 00
Specimen Plant, Large Flowered, or Chinese, named, P. Malley,	6 00
Second, William Martin,	5 00
Third, E. A. Wood,	4 00
Fourth, J. W. Scott,	3 00
Specimen Plant, Japanese, named, P. Malley,	6 00
Second, Edwin Fewkes & Son,	5 00
Third, William Martin,	4 00
Fourth, John W. Scott,	3 00
Specimen Plant, Pompon, named, P. Malley,	6 00
Second, William Martin,	5 00
Third, E. A. Wood,	4 00
Fourth, J. W. Scott,	3 00
Specimen Plant, Anemone, named, P. Malley,	6 00
Second, E. A. Wood,	5 00
Specimen trained standard, any class, William Martin,	6 00
Second, Edwin Fewkes & Son,	5 00
Third, Edwin Sheppard,	4 00
Best display of thirty named plants, in pots, all classes, not less than ten varieties, Edwin Fewkes & Son,	30 00
Second, P. Malley,	25 00
Third, Marshall P. Wilder,	20 00
Fourth, Samuel Neil,	15 00
Fifth, J. W. Scott,	10 00
Twelve Cut Blooms, Japanese, named, in vases, Edwin Fewkes & Son,	6 00
Second, Edwin Sheppard,	5 00
Six Cut Blooms, Large Flowered, or Chinese, named, in vases, Edwin Fewkes & Son,	4 00
Second, E. A. Wood,	3 00
Third, P. Malley,	2 00
Six Cut Blooms, Japanese, named, in vases, Edwin Fewkes & Son,	4 00
Second, E. A. Wood,	3 00

Display of twenty-four sprays, not less than twelve varieties, Large Flowered, or Chinese, named, in vases, Edwin Fewkes & Son,	$8 00
Second, Edwin Sheppard,	6 00
Third, J. W. Scott,	5 00
Display of twenty-four sprays, not less than twelve varieties, Japanese, named, in vases, Edwin Fewkes & Son,	8 00
Second, Edwin Sheppard,	6 00
Third, E. A. Wood,	5 00
Fourth, J. W. Scott,	4 00
Display of twenty-four sprays, not less than twelve varieties, Pompons, named, in vases, Edwin Fewkes & Son,	5 00
The fourth prize to Mrs. E. M. Gill,	2 00
Best arranged Basket of Blooms, Mrs. E. M. Gill,	5 00
Second, Mrs. A. D. Wood,	4 00
Bouquets.—Best pair of Hand, James O'Brien,	5 00
Second, Mrs. E. M. Gill,	4 00
Orchids.—Three Plants, named varieties, in bloom, Frederick L. Ames,	10 00
Second, Frederick L. Ames,	8 00
Third, William Martin,	6 00
Single Plant, in bloom, Frederick L. Ames,	5 00
Second, William Martin,	4 00
Third, Frederick L. Ames,	3 00

Gratuities:—

Henry P. Walcott, Chrysanthemums in pots,	25 00
W. A. Manda, " " "	25 00
Edwin Fewkes & Son, " " "	15 00
Edwin Sheppard, " " "	10 00
Mrs. Francis B. Hayes, " " "	10 00
W. A. Manda, Collection of Orchids,	10 00
Frederick L. Ames, " " " Ferns, etc.,	10 00
C. M. Hovey, *Maxillaria picta*,	2 00
Mrs. M. J. Plumstead, Seedling Chrysanthemums,	1 00
W. S. Ward, two plants, "	2 00
" " " Cut Flowers of "	1 00
William Martin, " " "	1 00
Mrs. E. M. Gill, " " "	1 00
Edwin Fewkes, " " " (two hundred bottles),	10 00
Edwin Sheppard, " " "	5 00
" " " " Pelargoniums,	2 00
Mrs. Francis B. Hayes, Cut Flowers,	3 00
Norton Brothers, six named Roses,	2 00
Miss Sarah W. Story, Basket of Chrysanthemums,	2 00
" " " " " " Flowers,	2 00
Mrs. P. D. Richards, Wild Flowers, Mosses, and Ferns,	2 00

DECEMBER 14.

Gratuities:—

Mrs. Francis B. Hayes, Two plants of *Cypripedium insigne*, . $2 00

GOLD MEDAL.

Rhododendron Show, June 5. H. Hollis Hunnewell, Display of named Hardy and Tender Rhododendrons and Hardy Azaleas.

SILVER MEDALS.

Spring Exhibition, March 24-26. John N. May, Tea Rose The Bride.
May 8. Nathaniel T. Kidder, Azalea Distinction.
Rhododendron Show, June 5. Jackson Dawson, Seedling Rhododendrons.
July 3. John L. Gardner, *Iris Kæmpferi.*
" " John B. Moore & Son, Display of Hybrid Perpetual Roses.
" 24. Frederick L. Ames, *Cattleya Gaskelliana.*
August 21. J. Warren Clark, Seedling Gladioli.
" 28. W. A. Manda, Seedling Single Dahlias.
September 4. J. W. Manning, Herbaceous Plants.
" " Mrs. E. M. Gill, Annuals.
Annual Exhibition, Sept. 14-17. E. D. Sturtevant, *Victoria regia.*
" " " " N. S. Simpkins, *Nymphæa Devoniensis.*
Chrysanthemum Show. November 10-12. Henry P. Walcott, Seedling Chrysanthemums.
" " " " Arthur H. Fewkes, Seedling Chrysanthemums.

BRONZE MEDALS.

Spring Exhibition, March 24-26. Weigand Brothers, Mignonette, Weigands' Giant.
" " " " Alexander Meston, gardener to Miss Dove, *Ouvirandra fenestralis.*
May 8. Marshall P. Wilder, Azalea Madame Louis Van Houtte.
June 5. W. A. Manda, *Sarracenia flava.*
" " Sewall Fisher, Seedling Carnations.
Rose Exhibition, June 22, 23. Edwin Fewkes & Son, Seedling Delphiniums.
July 3. John C. Hovey, forty-five species of hardy Alpine Sempervivums.
" " J. S. Richards, Display of Hybrid Perpetual Roses.
September 4. Mrs. L. P. Weston, Herbaceous Plants.
" " Miss S. W. Story, Annuals.

FIRST CLASS CERTIFICATES OF MERIT.

January 23. David Allan, *Urceolina pendula aurea.*
" " C. L. Allen & Co., skill in culture of Hinze's Carnations.
" 30. James Comley, Seedling Hybrid Tea Rose, Francis B. Hayes.
February 20. Mrs. Francis B. Hayes, *Rhododendron Veitchianum.*

March 6. John B. Moore & Son, superior culture of Hybrid Perpetual Rose Madame Gabriel Luizet.
" " David Allan, *Cattleya Roezli speciosa.*
Spring Exhibition, March 24-26. Charles J. Powers, *Narcissus cernuus flore pleno.*
" " " " Denys Zirngiebel, Carnations, La Purité, and Andalusia.
April 2. Mrs. E. M. Gill, Amaryllis Italia.
" 3. Jackson Dawson, *Rosa multiflora.*
" 10. W. A. Manda, *Aquilegia glandulosa.*
" 17. Robert T. Jackson, *Primula viscosa.*
May 29. J. W. Manning, *Onosma stellulata.*
" " W. A. Manda, *Gaillardia grandiflora maxima.*
June 5. Denys Zirngiebel, Myosotis Empress.
" 12. Mrs. F. B. Hayes, Seedling Clematis.
" " F. C. Hook, Seedling Aquilegias.
" " Jackson Dawson, *Hydrangea vestita.*
" 19. Arthur H. Fewkes, Seedling Aquilegias.
July 10. Samuel P. Fowler, Seedling *Asclepias tuberosa.*
" 24. J. F. C. Hyde, Seedling Hollyhocks.
" " David Allan, *Grammatophyllum Ellisii.*
August 7. W. E. Endicott, Hardy Hybrid Gladioli.
" " M. B. Faxon, New Sweet Peas.
" 14. F. L. Ames, *Cattleya Eldorado Amesiana.*
" 21. J. Warren Clark, Gladiolus Excelsior.
" 28. Denys Zirngiebel, Improved Asters.
September 4. H. B. Watts, New Gladioli.
" " John L. Gardner, well-grown Fuschias.
Annual Exhibition, September 14-17. H. H. Hunnewell, *Davallia Fijiensis.*
" " " " " " Seedling Dracænas.
Chrysanthemum Show, Nov. 10-12. Chas. F. Evans, New Rose, The Puritan.
" " " " Henry P. Walcott, Seedling Chrysanthemum, C. 22.
" " " " Henry P. Walcott, Seedling Chrysanthemum, Nevada.
" " " " Mrs. M. J. Plumstead, Seedling Chrysanthemum, Mrs. Laighton.
" " " " Arthur H. Fewkes, Seedling Chrysanthemum, President Hyde.
" " " " Arthur H. Fewkes, Seedling Chrysanthemum, Lizzie Gannon.
" " " " Arthur H. Fewkes, Seedling Chrysanthemum, H. A. Gane.
" " " " Arthur H. Fewkes, Seedling Chrysanthemum, Emily Selinger.
" " " " John Henderson, Tea Rose Père Gontier.

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1886.

By E. W. WOOD, CHAIRMAN.

The fruit product throughout the State has been unusually large the past season; with the single exception of peaches, all species have produced abundant crops. The fruit buds on the peach trees were again killed during the winter, and the query, heretofore suggested in these reports, whether the frequent failure of the peach crop should not be chiefly attributed to the diseased and enfeebled condition of the trees, rather than to any meteorologic changes in recent years, as compared with former times when the peach was successfully grown, seems to have received a partial answer in the results of the past season. One grower, who has competed at every exhibition when prizes have been offered, has done so almost entirely with seedling fruit. While he has a large number of trees of the ordinary varieties, on which the buds were destroyed, his seedling trees have produced fruit of excellent quality, indicating that the failure is owing to the condition of the trees rather than to any changed condition of soil or climate.

The competition for the prizes throughout the season has been larger than usual, owing in part to the abundance of fruit and also to the increased number of competitors, several having entered the lists who had not previously taken any part in the exhibitions.

The Strawberry Exhibition was one of more than ordinary interest to the growers, as there was an unusual number of new varieties shown, affording a favorable opportunity of comparing

their merits. The Belmont fully sustained the reputation given it in previous reports. As grown by the originators, Warren Heustis & Son, it has shown more points of excellence than any berry presented at our exhibitions for the last three years. The plants have been widely distributed the past season and we shall soon be able to judge whether or not it is adapted for general cultivation. P. M. Augur & Sons, of Middlefield, Conn., again showed their seedling, the Jewell. They labored under the disadvantage of being compelled to pick their fruit the day before the exhibition, and it did not have the bright, fresh appearance of fruit picked in the immediate vicinity. The plants of this variety have been distributed the past season, and we shall probably have an opportunity at the next exhibition of seeing the fruit under conditions equally favorable with those under which other varieties are shown. Hon. Marshall P. Wilder showed a new variety which he has named the Dorchester, and which in size, form, color, and quality, compared favorably with the best berries on exhibition. If it should prove vigorous in growth and productive it will take a front rank among the newer varieties.

While the plan, adopted the past three years, of showing Strawberries on plates affords the Committee the best possible opportunity for judging the fruit, and is the most convenient method for the growers, it does not show the fruit to the best advantage on the tables. When this plan was adopted, the premiums were so small that the growers' convenience and the waste of fruit were matters of considerable importance; but with the premiums almost doubled exhibitors will doubtless willingly conform to such regulations as will show the fruit to the best advantage. The Committee on Establishing Prizes have, in the Schedule soon to be issued, arranged the premiums for Strawberries in classes of four quarts, two quarts, and one quart, to be shown in baskets.

The weekly exhibitions, held after the Rose and Strawberry Show, June 22 and 23, until the Annual Exhibition, September 14 — 17, were well attended, and the quantity of summer fruit shown was unusually large, affording both visitors and growers the most favorable opportunity of comparing the merits of the different varieties; and, if supplemented by inquiries as to conditions of exposure and soil, with method of treatment, furnished all necessary information for their successful culture. There have been no new varieties of summer fruits shown deserving special notice,

but the prizes have been taken by well-known kinds. The Franconia and Cuthbert Raspberries, the Versaillaise Currant, and the Dorchester Blackberry have been the successful competitors.

At the Annual Exhibition the special premiums offered for the leading varieties among the different classes of fruits were all taken; and the competition for the regular prizes, especially those for Apples and Pears, was unusually large. These fruits were not of as good size as in some previous years when the crop was not so large. This was especially the case with the Baldwin apple, and this marked difference is hardly accounted for by the abundant crop, as some other varieties equally fruitful attained their normal size, and some kinds have been unusually good. Among the latter the Tompkins King has been remarkably fine, selected fruit of this variety having sold in the market here at five dollars per barrel, and the quantity not being sufficient to supply the demand, even at that price. The whole apple crop the past season has met with ready sale at fairly remunerative prices, the export trade taking the surplus above the demand for the home market; and at the present time, with the prices constantly tending upward, the supply does not fully meet the demand.

The display of Pears was fully equal to any made since the present plan of showing single dishes was adopted. The crop was an exceedingly large one; but it is the testimony of the wholesale fruit dealers that they have not for several years disposed of the pear crop more satisfactorily than the past season. Maine, New York, Philadelphia, and portions of Canada have drawn upon the Boston market for a partial supply of this fruit. Nowhere is the pear grown in greater perfection than in the vicinity of Boston; and, should the quantity be increased, the area of consumption may be widely extended.

Native Grapes have been shown in liberal quantities. A peculiar feature of the display at the Annual Exhibition was that but a single dish of Concords was seen, while some of the more uncertain varieties were shown in considerable quantities, and the prizes were all taken. Some extra fine bunches of Niagara were shown by J. P. Hayward, of Ashby, an extreme northern town bordering on the New Hampshire line. Growers whose vineyards were mostly of the earlier varieties disposed of their fruit at fair prices, but those who grew the Concords and later varieties and let them remain upon the vines, intending to supply the late trade,

suffered from the first frosts and the fruit was sold in a damaged condition, with unsatisfactory returns.

Foreign Grapes were shown in more than the usual quantity. David Allan presented a large number of varieties—among them a bunch of Victoria Hamburg weighing seven pounds, and a bunch of Syrian weighing eight pounds and four ounces. S. R. Payson and N. S. Simpkins also showed some large and well finished bunches.

At the October and November exhibitions the later varieties of Apples and Pears are shown much larger in size and in better condition than at the Annual Show in September; in fact, these exhibitions set before us the best types of these fruits as grown in this State; and the exhibitions of the past season on October 2 and November 10–12 were especially noteworthy for the quantity and quality of both apples and pears.

Of new fruits shown, to which allusion has not already been made, C. A. Dickinson presented, September 4, a seedling pear of good size and quality, but, coming at the same time as the Bartlett, which it can hardly be claimed to excel in any desirable quality, its cultivation will naturally be confined to the amateur.

There have been an unusually large number of seedling peaches shown, and among them some of good size and quality; and could vigorous, healthy stocks be secured, on which to bud them, we might reasonably hope for better success in the cultivation of this most desirable, and, when good crops can be produced, profitable fruit.

The Eaton Grape, as shown by John B. Moore & Son, has attracted much attention. In size of bunch and individual berries and in its generally attractive appearance, it excels any native grape shown at our exhibitions.

Of fruits entered for the Prospective Prizes, there are the Hayes Grape, the Belmont and Jewell Strawberries, and a seedling Peach by J. W. Page. In the judgment of the Committee, none of them have been sufficiently cultivated by others than the originators to justify awarding the prizes at the present time.

Of the appropriation of $1,700 the Committee have awarded in prizes and gratuities $1,624, leaving an unexpended balance of $76.

In reviewing the year, we find much to encourage the cultivators of fruit, both for commerce and domestic use. The most valuable

New England fruit, the apple, is becoming every year more exclusively the farmer's product, the limited grounds in the cities and larger towns not affording sufficient space to grow the trees. Previously to 1876 an abundant crop was a disadvantage to the growers as the over-supply reduced the price below a paying one. In that year there were exported to foreign markets three hundred and forty thousand barrels. Since then the number of barrels has reached one and a half million in a single year, and the shipments the present year have sometimes in a single week exceeded eighty thousand barrels. The farmers have not yet realized the changed conditions and do not make fruit a principal or leading crop. It is generally an incidental and not infrequently an accidental one. The fact that we have in this State thousands of acres of cheap lands admirably adapted to the cultivation of fruit — most favorably situated to meet the demand for export trade, coupled with the fact that the farmers can send their fruit from Boston to the London market at less cost than the growers living within forty miles of that city, ought to make fruit one of the leading agricultural products of the State.

E. W. Wood,
Benj. G. Smith,
O. B. Hadwen,
Jacob W. Manning,
Chas. F. Curtis,
E. P. Richardson,
Warren Fenno.

Fruit Committee.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

JANUARY 2.

Gratuities:—

B. Seavey, Oranges, ... $1 00
Winn & Ricker, Oranges and Lemons, ... 2 00

JANUARY 16.

Gratuity:—

Marshall P. Wilder, Pears, ... 1 00

JANUARY 23.

Gratuity:—

A. McDermott, Pears, ... 1 00

SPRING EXHIBITION.

MARCH 24, 25, AND 26.

WINTER APPLES.—Any variety, William T. Hall, Northern Spy, . $3 00
Second, Samuel Hartwell, Hunt Russet, ... 2 00
WINTER PEARS.—Any variety, Warren Fenno, Duchess of Bordeaux, 3 00
Second, Warren Fenno, Josephine of Malines, ... 2 00

Gratuity:—

C. C. Shaw, Collection of Apples, ... 2 00

APRIL 10.

Gratuity:—

W. C. Winter, Peaches, ... 1 00

APRIL 17.

Gratuity:—

George Hill, Strawberries, ... 1 00

JUNE 5.

Gratuity:—

L. W. Weston, Crescent Strawberries, ... 2 00

JUNE 12.

Gratuities:—

George Hill, Sharpless Strawberries,	$2 00
C. E. Grant, Longfellow and Downing Strawberries,	1 00
L. W. Weston, Crescent Strawberries,	1 00
William Doran & Son, Downing, Sharpless, and Manchester Strawberries,	1 00
W. C. Eustis, Downing and Sharpless Strawberries,	1 00
H. W. Killam, Cherries,	2 00

JUNE 19.

Gratuities:—

George Hill, Sharpless Strawberries,	2 00
W. C. Eustis, Sharpless and Downing Strawberries,	1 00

ROSE AND STRAWBERRY EXHIBITION.

JUNE 22 AND 23.

Special Prizes.

STRAWBERRIES.—Four quarts of any variety, Warren Heustis & Son, Belmont, Silver Cup, value	$20 00
Second, N. S. Simpkins, Sharpless,	15 00
Third, P. M. Augur, Jewell,	10 00
Fourth, J. D. Fitts, Jersey Queen,	5 00

Two quarts of any variety, to be judged by the following scale of points:—

Quality,	50
Productiveness,	20
Form,	10
Color,	10
Size,	10

Warren Heustis & Son, Belmont,	12 00
Second, W. C. Winter, Wilder,	9 00
Third, E. W. Wood, Hervey Davis,	6 00
Fourth, Joseph D. Fitts, Jersey Queen,	3 00

For the best exhibition of a seedling Strawberry introduced within the last five years, and never having taken a prize, E. W. Wood, Gold, Silver Medal.

Regular Prizes.

STRAWBERRIES.—Forty-eight berries of Bidwell, William Patterson,	4 00
Second, Isaac E. Coburn,	3 00
Third, George V. Fletcher,	2 00

Charles Downing, C. M. Hovey,	$4 00
Second, C. N. Brackett,	3 00
Third, Benjamin G. Smith,	2 00
Cumberland, Warren Heustis & Son,	4 00
Hervey Davis, E. W. Wood,	4 00
Hovey, C. M. Hovey,	3 00
Jucunda, J. L. Gardner,	4 00
Miner's Prolific, J. D. Fitts,	4 00
Second, Oliver R. Robbins,	3 00
Third, Isaac E. Coburn,	2 00
Seth Boyden, Marshall P. Wilder,	4 00
Sharpless, William C. Winter,	4 00
Second, William Doran & Son,	3 00
Third, C. M. Hovey,	2 00
Wilder, Marshall P. Wilder,	4 00
Twenty-four berries of Bidwell, Isaac E. Coburn,	3 00
Second, William Patterson,	2 00
Brighton, Warren Fenno,	2 00
Champion, Marshall P. Wilder,	3 00
Second, J. D. Fitts,	2 00
Charles Downing, Isaac E. Coburn,	3 00
Second, L. W. Weston,	2 00
Cumberland, William Patterson,	3 00
Second, George L. Lovett,	2 00
Hervey Davis, E. W. Wood,	3 00
Second, Marshall P. Wilder,	2 00
Jersey Queen, Marshall P. Wilder,	3 00
Second, J. D. Fitts,	2 00
Jucunda, J. D. Fitts,	3 00
Manchester, Charles E. Churchill,	3 00
Second, J. D. Fitts,	2 00
Miner's Prolific, Isaac E. Coburn,	3 00
Second, J. D. Fitts,	2 00
Pioneer, E. W. Wood,	3 00
Second, Benjamin G. Smith,	2 00
Seth Boyden, J. D. Fitts,	3 00
Sharpless, Marshall P. Wilder,	3 00
Second, George L. Lovett,	2 00
Collection of not less than six varieties, one quart of each, Marshall P. Wilder,	8 00
Second, J. D. Fitts,	6 00
One quart of any new variety not previously exhibited, Marshall P. Wilder, Prince,	3 00
Second, Marshall P. Wilder, Parry,	2 00
CHERRIES.—Two quarts of any variety, I. P. Langworthy, Knight's Early Black,	2 00
Second, S. Lockwood, Jr., Black Tartarian,	1 00

FOREIGN GRAPES.—Two bunches of any variety, E. S. Converse, West's St. Peters, ... $6 00
Second, E. S. Converse, Black Hamburg, ... 4 00
FORCED PEACHES, any variety, W. C. Winter, Crawford's Early, . 3 00
Second, W. C. Winter, Foster, ... 2 00

Gratuities:—

George L. Lovett, Strawberries, ... 2 00
C. M. Hovey, " 1 00
C. E. Grant, " 1 00
Albert Bresee, Seedling Strawberries, ... 2 00

JULY 3.

STRAWBERRIES.—Twenty-four berries of any variety, W. Heustis & Son, Belmont, ... 3 00
Second, W. Heustis & Son, Middlesex, ... 2 00
Third, W. Heustis & Son, Cumberland, ... 1 00
CHERRIES.—Two quarts of Black Eagle, J. L. Gardner, . . . 2 00
Black Tartarian, Charles F. Curtis, ... 2 00
Coe's Transparent, S. Lockwood, Jr., ... 2 00
Downer's Late, S. Lockwood, Jr., ... 2 00
Any other variety, S. Lockwood, Jr., Reine Hortense, . . . 2 00
Second, C. N. Brackett, Merriam, ... 1 00

Gratuities:—

M. W. Chadbourne, Currants, ... 1 00
W. C. Winter, Peaches and Figs, ... 2 00
C. M. Hovey, Richardson Cherries, ... 1 00

JULY 10.

CHERRIES.—Two quarts of any variety, Warren Fenno, Norfolk, . 2 00
Second, C. F. Curtis, Hyde's Black, ... 1 00
RASPBERRIES.—Two quarts of any variety, Benjamin G. Smith, Franconia, ... 3 00
Second, J. B. Moore & Son, Souchetti, ... 2 00
Third, William Doran & Son, Red Antwerp, ... 1 00
CURRANTS.—Forty-eight bunches of any Red variety, Benjamin G. Smith, Versaillaise, ... 4 00
Second, Hittinger Brothers, Versaillaise, ... 3 00
Third, Edwin Hastings, " 2 00
Forty-eight bunches of any White variety, W. K. Wood, Dana's Transparent, ... 3 00
Second, Benjamin G. Smith, White Gondouin, ... 2 00

Gratuities:—

Hittinger Brothers, Four varieties of Cherries,	$2 00
C. N. Brackett, Two varieties of Cherries,	1 00
Mrs. E. M. Gill, Currants,	1 00
W. Heustis & Son, Belmont Strawberries,	1 00

JULY 17.

RASPBERRIES.—Collection of not less than four varieties, two quarts of each, William Doran & Son,	4 00
Two quarts of any variety, B. Judkins,	3 00
Second, William Doran & Son,	2 00
BLACK CAPS.—Two quarts of any variety, B. Judkins,	2 00
CURRANTS.—Twenty-four bunches of Versaillaise, William Doran & Son,	2 00
Second, Benjamin G. Smith,	1 00
Any other Red variety, Benjamin G. Smith, Fay's Prolific,	2 00
Second, William Doran & Son, Red Dutch,	1 00
Any White variety, Benjamin G. Smith, Dana's Transparent,	2 00
Second, Benjamin G. Smith, French Transparent,	1 00

Gratuities:—

W. Heustis & Son, Strawberries,	1 00
Charles N. Brackett, Cherries,	1 00
Warren Fenno, Cherries and Currants,	1 00
A. S. McIntosh, Cherries and Raspberries,	1 00
S. Lawrence, Fay's Prolific Currants,	1 00
O. R. Robbins, Currants,	1 00
William C. Strong, Gooseberries,	1 00
Edwin A. Hall, "	1 00
Benjamin G. Smith, June Berries,	1 00

JULY 24.

RASPBERRIES.—Two quarts of any variety, Benjamin G. Smith, Franconia,	3 00
Second, A. S. McIntosh, Franconia,	2 00
CURRANTS.—Twenty-four bunches of any Red variety, Benjamin G. Smith, Versaillaise,	3 00
Second, William H. Spooner, Versaillaise,	2 00
Third, Warren Fenno, Versaillaise,	1 00
Any White variety, Benjamin G. Smith, Dana's Transparent,	2 00
Second, Benjamin G. Smith, French Transparent,	1 00
BLACKBERRIES.—Two quarts of any variety, A. S. McIntosh, Dorchester,	3 00
Second, M. W. Chadbourne, Dorchester,	2 00
Third, Samuel McIntosh, Dorchester,	1 00
GOOSEBERRIES.—Two quarts of any Native variety, Benjamin G. Smith, Smith's Improved,	3 00
Second, Warren Fenno, Downing,	2 00

Gratuities:—

Warren Fenno, Gooseberries,	$2 00
William Richardson, Currants,	1 00
J. H. Woodford, "	1 00
M. W. Chadbourne, Collection,	1 00

JULY 31.

BLACKBERRIES.—Two quarts of any variety, L. W. Weston, Dorchester,	3 00
Second, M. W. Chadbourne, Dorchester,	2 00
Third, A. S. McIntosh, Dorchester,	1 00
GOOSEBERRIES.—Two quarts of Foreign, Benjamin G. Smith, Whitesmith,	2 00
Second, Benjamin G. Smith, Bang-Up,	1 00
PEARS.—Summer Doyenne, Warren Fenno,	3 00
Second, Benjamin G. Smith,	2 00
Any other variety, A. S. McIntosh, Madeleine,	3 00
Second, Warren Fenno, "	2 00
Third, C. Terry, "	1 00

Gratuities:—

Sarah M. Vose, Blackberries,	1 00
Mrs. E. M. Gill, Gooseberries,	1 00
Hittinger Brothers, Apples,	1 00
Samuel Hartwell, "	1 00
Joseph W. Page, Seedling Peaches,	2 00
Francis Smith, Alexander Peaches,	1 00
J. C. Coolidge, Peaches,	2 00
George W. Wilkinson, Peaches,	1 00

AUGUST 7.

APPLES.—Early Harvest, Benjamin G. Smith,	2 00
Second, Warren Fenno,	1 00
Sweet Bough, Joseph G. Coolidge,	3 00
Second, Warren Heustis & Son,	2 00
Third, Hittinger Brothers,	1 00
Any other variety, Charles N. Brackett, Early Margaret,	3 00
Second, Charles F. Curtis, Williams,	2 00
Third, M. W. Chadbourne, Red Astrachan,	1 00
PEARS.—Giffard, Mrs. Mary Langmaid,	3 00
Second, Warren Fenno,	2 00
Third, Charles N. Brackett,	1 00
Any other variety, Marshall P. Wilder, Quimper,	3 00
Second, A. S. McIntosh, Clapp's Favorite,	2 00
Third, Samuel Hartwell, " "	1 00

Blackberries.—Two quarts of any variety, M. W. Chadbourne, Dorchester,	$3 00
Second, A. S. McIntosh,	2 00
Third, B. C. Vose,	1 00
Gratuities:—	
Horace Eaton, Blackberries,	1 00
B. W. Priest, Seedling Blackberries,	1 00
Benjamin G. Smith, Gooseberries,	1 00
Horace Eaton, Early Rivers Peaches,	1 00
Marshall P. Wilder, Early Louise Peaches,	1 00
S. H. Record, Foreign Grapes,	2 00

August 14.

Apples.— Oldenburg, Samuel Hartwell,	3 00
Second, Warren Fenno,	2 00
Red Astrachan, M. W. Chadbourne,	3 00
Second, Charles F. Curtis,	2 00
Third, Samuel Hartwell,	1 00
Williams's Favorite, Samuel Hartwell,	3 00
Second, Charles F. Curtis,	2 00
Third, Hittinger Brothers,	1 00
Pears.— Clapp's Favorite, Samuel Hartwell,	3 00
Second, Warren Fenno,	2 00
Third, Warren Heustis & Son,	1 00
Manning's Elizabeth, Mrs. Mary Langmaid,	2 00
Second, Warren Fenno,	1 00
Any other variety, George Frost, Quimper,	2 00
Second, Charles N. Brackett, Brandywine,	1 00
Foreign Grapes.— Two bunches of any variety, David Allan, Black Hamburg,	5 00
Gratuities:—	
C. E. Grant, Apples and Pears,	1 00
Horace Eaton, Apples and Plums,	1 00
M. W. Chadbourne, Pears,	1 00
Benjamin G. Smith, Plums,	1 00
C. B. Lancaster, Peaches,	1 00
Samuel Hartwell, Peaches and Plums,	2 00
Warren Fenno, " " "	1 00
Robert Manning, Briton Blackberries,	1 00

August 21.

Pears.— Bartlett, Mrs. Mary Langmaid,	3 00
Second, Warren Fenno,	2 00
Third, Samuel Hartwell,	1 00

Rostiezer, M. W. Chadbourne,	$3 00
Second, Charles N. Brackett,	2 00
Third, John McClure,	1 00
Tyson, A. S. McIntosh,	3 00
Second, Samuel McIntosh,	2 00
Third, J. A. C. Norton,	1 00
Any other variety, A. S. McIntosh, Clapp's Favorite,	3 00
Second, William H. Hunt, " "	2 00
Third, C. S. Hosmer, " "	1 00
PEACHES.—Any variety, C. B. Lancaster, Coolidge's Favorite,	3 00
Second, N. D. Harrington, Seedling,	2 00
Third, Warren Fenno, Hale's Early,	1 00

Gratuities: —

Samuel Hartwell, Apples and Plums,	3 00
Mrs. Francis B. Hayes, Apples and Pears,	1 00
M. W. Chadbourne, " " "	1 00
Warren Fenno, " " "	1 00
Charles N. Brackett, Apples,	1 00
C. E. Grant, "	1 00
Robert Manning, Pears,	1 00
S. Lockwood, Jr., Plums,	1 00
Horace Eaton, "	1 00
Martin Pfaffman, "	1 00

AUGUST 28.

APPLES.—Any variety, Samuel Hartwell, Gravenstein,	3 00
Second, Samuel Hartwell, Oldenburg,	2 00
Third, L. W. Weston, Foundling,	1 00
PEARS.—Bartlett, Mrs. Mary Langmaid,	3 00
Second, Samuel Hartwell,	2 00
Third, Varnum Frost,	1 00
Any other variety, George L. Lovett, Clapp's Favorite,	3 00
Second, C. Terry, " "	2 00
Third, A. S. McIntosh, Tyson,	1 00
PEACHES.—Any variety, C. B. Lancaster, Coolidge's Favorite,	3 00
Second, N. D. Harrington, Seedling,	2 00
Third, Warren Fenno, Hale's Early,	1 00
PLUMS.—Any variety, Mrs. H. V. Draper, Washington,	3 00
Second, George S. Curtis, Bradshaw,	2 00
Third, Horace Eaton, Washington,	1 00
NATIVE GRAPES.—Any variety, Samuel Hartwell, Moore's Early,	3 00
Second, Benjamin G. Smith, Champion,	2 00

Gratuities:—

Samuel Hartwell, Apples,	2 00
Charles N. Brackett, Apples and Pears,	1 00

M. W. Chadbourne, Apples and Pears,	$1 00
C. E. Grant, " " "	1 00
Warren Fenno, Apples, Peaches, and Pears,	1 00
A. S. McIntosh, Pears,	1 00
Mrs. F. B. Hayes, Grapes,	1 00

SEPTEMBER 4.

APPLES.—Foundling, L. W. Weston,	3 00
Second, Samuel Hartwell,	2 00
Third, Francis Smith,	1 00
Gravenstein, Samuel Hartwell,	3 00
Second, George L. Lovett,	2 00
Third, Varnum Frost,	1 00
Porter, Benjamin G. Smith,	3 00
Second, Francis Smith,	2 00
Third, Mrs. F. B. Hayes,	1 00
Any other variety, Samuel Hartwell, Summer Pippin,	3 00
Second, Samuel Hartwell, Chenango,	2 00
Third, Warren Fenno, Alexander,	1 00
PEARS.—Andrews, Mrs. Mary Langmaid,	3 00
Second, Warren Fenno,	2 00
Third, C. A. Dickinson,	1 00
Boussock, George S. Harwood,	3 00
Second, Horace Eaton,	2 00
Third, Mrs. Mary Langmaid,	1 00
Any other variety, C. A. Dickinson, Seedling,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Varnum Frost,	1 00
PEACHES.—Collection, N. D. Harrington,	4 00
PLUMS.—Collection of not less than four varieties, Samuel Hartwell,	3 00
Second, Horace Eaton,	2 00
Third, William H. Hunt,	1 00
Any other variety, Horace Eaton, Washington,	2 00
Second, Samuel Hartwell, "	1 00
NATIVE GRAPES.—Hartford, T. M. Davis,	2 00
Moore's Early, J. B. Moore & Son,	3 00
Second, Samuel Hartwell,	2 00
Any other variety, Warren Fenno, Champion,	3 00
Second, Benjamin G. Smith, Cottage,	2 00

Gratuities:—

Samuel Hartwell, Apples,	1 00
M. W. Chadbourne, Apples and Pears,	1 00
Charles N. Brackett, " " "	1 00
A. S. McIntosh, " " "	1 00
T. M. Davis, Pears and Peaches,	1 00

Warren Fenno, Nectarines,	$1 00
William Richardson, Assorted Fruits,	1 00
Isaac Ellis, Strawberries in Pots,	1 00

ANNUAL EXHIBITION.

SEPTEMBER 14, 15, 16, AND 17.

French Premiums for Apples.

Twelve Baldwin, Samuel Hartwell,	$5 00
Twelve Gravenstein, Samuel Hartwell,	5 00
Twelve Hubbardston, M. W. Chadbourne,	5 00
Twelve Rhode Island Greening, C. E. Grant,	5 00

Special Prizes offered by the Society.

PEARS.—Twelve Anjou, Mrs. Mary Langmaid,	5 00
Twelve Bartlett, Mrs. Mary Langmaid,	5 00
Twelve Bosc, George S. Harwood,	5 00
Twelve Seckel, George S. Harwood,	5 00
Twelve Sheldon, George S. Harwood,	5 00
Twelve Peaches of any variety, N. D. Harrington, Seedling,	5 00
Twelve Bunches of Native Grapes of any variety, J. B. Moore & Son, Moore's Early,	5 00
For the heaviest and best ripened bunch of any Foreign Black Grape, not less than five pounds, David Allan, Victoria Hamburg, seven pounds,	8 00
For the heaviest and best ripened bunch of any Foreign White Grape, not less than five pounds, David Allan, Syrian, eight pounds and four ounces,	8 00

Regular Prizes.

APPLES.—Baldwin, C. C. Shaw,	4 00
Second, Samuel Hartwell,	3 00
Third, Warren Fenno,	2 00
Danvers Sweet, Charles N. Brackett,	3 00
Second, Warren Fenno,	2 00
Third, C. C. Shaw,	1 00
Dutch Codlin, Benjamin G. Smith,	2 00
Second, L. W. Weston,	1 00
Holden, O. B. Hadwen,	3 00
Second, H. B. Watts,	2 00
Third, Samuel Hartwell,	1 00
Fameuse, George V. Fletcher,	3 00
Second, Benjamin G. Smith,	2 00
Third, Horace Eaton,	1 00

Foundling, L. W. Weston,	$4 00
Second, Francis Smith,	3 00
Third, Samuel Hartwell,	2 00
Garden Royal, the second prize to C. E. Grant,	2 00
Golden Russet, L. W. Weston,	2 00
Second, Horace Eaton,	1 00
Gravenstein, George S. Curtis,	4 00
Second, Warren Heustis & Son,	3 00
Third, George L. Lovett,	2 00
Hubbardston, William H. Hunt,	4 00
Second, Charles N. Brackett,	3 00
Third, M. W. Chadbourne,	2 00
Hunt Russet, Mrs. F. B. Hayes,	3 00
Second, William H. Hunt,	2 00
Third, Samuel Hartwell,	1 00
Lady's Sweet, Horace Eaton,	2 00
Leicester, O. B. Hadwen,	2 00
Lyscom, Samuel Hartwell,	2 00
Maiden's Blush, L. R. Eames,	2 00
Second, George L. Lovett,	1 00
Mother, George C. Rice,	3 00
Second, E. W. Wood,	2 00
Third, Warren Fenno,	1 00
Northern Spy, C. C. Shaw,	3 00
Second, Warren Fenno,	2 00
Third, W. A. Morse, Jr.,	1 00
Porter, S. H. Coombs,	3 00
Second, Francis Smith,	2 00
Third, M. W. Chadbourne,	1 00
Pumpkin Sweet, George Seaverns,	2 00
Second, Samuel Hartwell,	1 00
Rhode Island Greening, C. E. Grant,	4 00
Second, E. W. Wood,	3 00
Third, Charles N. Brackett,	2 00
Roxbury Russet, Warren Heustis & Son,	4 00
Second, W. C. Eustis,	3 00
Third, Benjamin G. Smith,	2 00
Tolman's Sweet, Josiah Crosby,	3 00
Second, J. T. Foster,	2 00
Third, C. F. Curtis,	1 00
Tompkins King, George C. Rice,	3 00
Second, W. C. Eustis,	2 00
Third, Samuel Hartwell,	1 00
Washington Royal or Palmer, O. B. Hadwen,	3 00
Second, Samuel Hartwell,	2 00
Washington Strawberry, George C. Rice,	2 00
Second, Miss Sarah W. Story,	1 00

Any other variety, L. R. Eames, Alexander,	$3 00
Second, Warren Fenno, Alexander,	2 00
Third, Samuel Hartwell, Chenango,	1 00
CRAB APPLES.—Hyslop, twenty-four specimens, George C. Rice,	2 00
Second, M. W. Chadbourne,	1 00
Transcendent, George W. Stevens,	2 00
Second, Warren Fenno,	1 00
PEARS.—Angouleme, Mrs. H. P. Kendrick,	4 00
Second, John McClure,	3 00
Third, Warren Fenno,	2 00
Anjou, Hittinger Brothers,	4 00
Second, W. S. Janvrin,	3 00
Third, John McClure,	2 00
Fourth, Mrs. Mary Langmaid,	1 00
Bartlett, Varnum Frost,	4 00
Second, Warren Fenno,	3 00
Third, Mrs. H. P. Kendrick,	2 00
Fourth, N. D. Harrington,	1 00
Belle Lucrative, Mrs. Mary Langmaid,	3 00
Second, Warren Heustis & Son,	2 00
Third, David Allan,	1 00
Bosc, Mrs. Mary Langmaid,	4 00
Second, Warren Fenno,	3 00
Third, W. P. Walker,	2 00
Fourth, C. N. Brackett,	1 00
Boussock, George S. Harwood,	3 00
Second, Marshall P. Wilder,	2 00
Third, Horace Eaton,	1 00
Clairgeau, W. P. Plimpton,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Warren Heustis & Son,	1 00
Comice, Warren Fenno,	3 00
Second, George S. Harwood,	2 00
Third, Mrs. Mary Langmaid,	1 00
Dana's Hovey, Mrs. Mary Langmaid,	4 00
Second, Theodore Lyman,	3 00
Third, C. M. Hovey,	2 00
Diel, Edwin A. Hall,	3 00
Second, Jacob Eaton,	2 00
Third, A. S. McIntosh,	1 00
Goodale, O. B. Hadwen,	3 00
Second, Marshall P. Wilder,	2 00
Hardy, Charles F. Curtis,	3 00
Second, Mrs. H. P. Kendrick,	2 00
Third, David Allan,	1 00
Howell, Ex. W. Wood,	3 00
Second, W. S. Janvrin,	2 00

Third, C. A. Dickinson,	$1 00
Lawrence, John McClure,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Samuel Hartwell,	1 00
Louise Bonne of Jersey, T. M. Davis,	3 00
Second, Mrs. H. P. Kendrick,	2 00
Third, Joseph Brierly,	1 00
Marie Louise, C. M. Hovey,	3 00
Second, Warren Fenno,	2 00
Third, A. S. McIntosh,	1 00
Merriam, A. S. McIntosh,	3 00
Second, Charles F. Curtis,	2 00
Third, Samuel McIntosh,	1 00
Onondaga, W. C. Eustis,	3 00
Second, C. M. Hovey,	2 00
Third, M. W. Chadbourne,	1 00
Paradise of Autumn, George L. Lovett,	3 00
Second, William H. Hunt,	2 00
Third, Marshall P. Wilder,	1 00
Seckel, N. D. Harrington,	4 00
Second, Hittinger Brothers,	3 00
Third, George S. Harwood,	2 00
Sheldon, George S. Harwood,	4 00
Second, Mrs. Mary Langmaid,	3 00
Third, Warren Heustis & Son,	2 00
Souvenir du Congrès, Marshall P. Wilder,	3 00
Second, Charles N. Brackett,	2 00
Third, J. T. Foster,	1 00
St. Michael Archangel, T. M. Davis,	3 00
Second, Charles M. Hovey,	2 00
Third, Warren Heustis,	1 00
Superfin, Warren Fenno,	3 00
Second, W. P. Walker,	2 00
Third, E. W. Wood,	1 00
Urbaniste, M. W. Chadbourne,	3 00
Second, John L. Bird,	2 00
Third, C. M. Hovey,	1 00
Winter Nelis, Edwin A. Hall,	3 00
Second, Jacob Eaton,	2 00
Third, Warren Fenno,	1 00
Any other variety, Marshall P. Wilder, Lemuel Clapp,	3 00
Second, S. P. Sharpless, Pratt,	2 00
Third, John L. Bird, Kingsessing,	1 00
PEACHES.—Crawford's Early, N. D. Harrington,	3 00
Second, W. S. Janvrin,	2 00
Oldmixon, S. Rodden,	3 00
Any other variety, N. D. Harrington, Crawford's Late,	3 00

Second, S. Rodden, Red Cheek Melocoton,	$2 00
Third, Andrew Burnham, Florence,	1 00
PEACHES.—Orchard House Culture, S. Rodden, Crawford's Late,	4 00
NECTARINES.—Warren Fenno, Seedling,	2 00
PLUMS.—Not less than four varieties, Horace Eaton,	5 00
Second, Samuel Hartwell,	4 00
Third, Hittinger Brothers,	3 00
Any other variety, Benjamin G. Smith, Coe's Golden Drop,	3 00
Second, Horace Eaton, Yellow Egg,	2 00
Third, J. B. Moore & Son, Pond's Seedling,	1 00
NATIVE GRAPES.—Brighton, Marshall P. Wilder,	3 00
Second, Joseph S. Chase,	2 00
Third, Samuel Hartwell,	1 00
Concord, William Doran & Son,	3 00
Cottage, William H. Hunt,	3 00
Second, Benjamin G. Smith,	2 00
Third, Samuel Hartwell,	1 00
Delaware, Marshall P. Wilder,	3 00
Second, J. P. Hayward,	2 00
Third, Samuel Hartwell,	1 00
Massasoit, Marshall P. Wilder,	3 00
Second, Cephas H. Brackett,	2 00
Third, John B. Moore & Son,	1 00
Moore's Early, John B. Moore & Son,	3 00
Second, Samuel Hartwell,	2 00
Wilder, Marshall P. Wilder,	3 00
Worden, Oliver R. Robbins,	3 00
Second, John B. Moore & Son,	2 00
Third, Samuel Hartwell,	1 00
Any other variety, Benjamin G. Smith, Lindley,	3 00
Second, J. P. Hayward, Niagara,	2 00
Third, J. P. Hayward, Rochester,	1 00
FOREIGN GRAPES.—Four varieties, two bunches each, David Allan,	10 00
Second, E. W. Wood,	8 00
Wilmot's Hamburg, Two bunches, David Allan,	5 00
Second, E. W. Wood,	4 00
Muscat of Alexandria, S. R. Payson,	5 00
Second, David Allan,	4 00
Black Hamburg, David Allan,	5 00
Second, E. W. Wood,	4 00
Any other variety, N. S. Simpkins, Syrian,	5 00
Second, David Allan, Alicante,	4 00
CRANBERRIES.—Half-peck, Dwight C. Robbins,	3 00
Gratuities:—	
Charles M. Hovey, Apples and Pears,	5 00
Warren Fenno, " " "	3 00

Mrs. M. T. Goddard, Apples and Pears,	$2 00
C. N. Brackett, " " "	3 00
Samuel Hartwell, " " "	2 00
M. W. Chadbourne, " " "	2 00
William A. Morse, " " "	2 00
A. S. McIntosh, " " "	2 00
Albert Bresee, " " "	1 00
G. W. Hall, " " "	1 00
Mrs. Francis B. Hayes, " " "	1 00
Marshall P. Wilder, Pears,	2 00
Charles F. Curtis, "	2 00
W. A. Morse, Jr., "	1 00
Alexander Beal, "	1 00
George Seaverns, Quinces,	1 00
W. C. Eustis, "	1 00
Marshall P. Wilder, Collection of Grapes,	3 00
J. B. Moore & Son, Eaton Grape,	1 00
C. H. Johnson, Seedling Peaches,	2 00
Robert Manning, Cornelian Cherries,	1 00
H. L. Barnes, Osage Oranges,	1 00

EXHIBITION OF AUTUMN FRUITS.

October 2.

Apples.—Gravenstein, Samuel Hartwell,	3 00
Second, Charles N. Brackett,	2 00
Third, Warren Heustis & Son,	1 00
Holden, Francis Smith,	3 00
Second, Samuel Hartwell,	2 00
Mother, George C. Rice,	3 00
Second, Warren Fenno,	2 00
Porter, Charles N. Brackett,	3 00
Second, Francis Smith,	2 00
Any other variety, M. W. Chadbourne, Hubbardston,	3 00
Second, George Hill, Hubbardston,	2 00
Pears.—Angouleme, John McClure,	3 00
Second, W. S. Janvrin,	2 00
Third, Mrs. H. P. Kendrick,	1 00
Bosc, Mrs. Mary Langmaid,	3 00
Second, Warren Fenno,	2 00
Third, Hittinger Brothers,	1 00
Clairgeau, W. P. Plimpton,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Warren Heustis & Son,	1 00
Comice, Warren Fenno,	3 00

Second, W. P. Plimpton,	$2 00
Third, George S. Harwood,	1 00
Frederick Clapp, O. B. Hadwen,	3 00
Second, Horace Eaton,	2 00
Louise Bonne of Jersey, T. M. Davis,	3 00
Second, W. P. Walker,	2 00
Third, George Hill,	1 00
Seckel, George S. Harwood,	3 00
Second, N. D. Harrington,	2 00
Third, Hittinger Brothers,	1 00
Sheldon, George S. Harwood,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Cephas H. Brackett,	1 00
Superfin, L. M. Chase,	3 00
Second, Michael Finnegan,	2 00
Third, Warren Fenno,	1 00
Urbaniste, M. W. Chadbourne,	3 00
Second, T. M. Davis,	2 00
Third, John L. Bird,	1 00
Any other variety, Warren Fenno, Hardy,	3 00
Second, A. S. McIntosh, Merriam,	2 00
Third, George Hill, Howell,	1 00
QUINCES.—C. D. Fiske,	2 00
Second, Benjamin G. Smith,	1 00
PEACHES.—Any variety, N. D. Harrington, Seedling,	3 00
Second, C. H. Johnson,	2 00
Third, Warren Fenno,	1 00
NATIVE GRAPES.—Brighton, Benjamin G. Smith,	3 00
Second, Joseph S. Chase,	2 00
Third, A. M. Davenport,	1 00
Concord, A. J. Bigelow,	3 00
Second, G. B. Andrews,	2 00
Third, J. P. Hayward,	1 00
Delaware, J. P. Hayward,	3 00
Second, Benjamin G. Smith,	2 00
Third, Joseph S. Chase,	1 00
Iona, Horace Eaton,	3 00
Second, Benjamin G. Smith,	2 00
Third, J. W. Page,	1 00
Isabella, Samuel G. Stone,	3 00
Second, C. Terry,	2 00
Third, T. M. Davis,	1 00
Lindley, J. P. Hayward,	3 00
Second, Benjamin G. Smith,	2 00
Third, A. M. Davenport,	1 00
Massasoit, A. M. Davenport,	3 00
Second, J. B. Moore & Son,	2 00

Third, J. P. Hayward, ... $1 00
Moore's Early, J. B. Moore & Son, ... 3 00
Second, Samuel Hartwell, ... 2 00
Prentiss, Benjamin G. Smith, ... 3 00
Second, Joseph S. Chase, ... 2 00
Wilder, J. P. Hayward, ... 3 00
Second, E. A. Adams, ... 2 00
Any other variety, Horace Eaton, Eaton, ... 3 00
Second, J. P. Hayward, Niagara, ... 2 00
Third, J. B. Moore & Son, Hayes, ... 1 00
Foreign Grapes.—Two bunches of any variety, David Allan, Golden Queen, ... 4 00
Second, David Allan, Muscat of Alexandria, ... 3 00

Gratuities:—

C. D. Tuttle, Apples, ... 1 00
M. W. Chadbourne, Apples and Pears, ... 1 00
A. S. McIntosh, Pears, ... 1 00
T. M. Davis, Pears and Peaches, ... 1 00
Benjamin G. Smith, Plums, ... 1 00
Samuel Hartwell, " 1 00
A. M. Davenport, Grapes, ... 1 00
Joseph S. Chase, " 1 00
J. B. Moore & Son, Eaton Grapes, First Class Certificate of Merit.

October 16.

Gratuities:—

W. C. Eustis, Apples, ... 1 00
N. D. Harrington, Seckel Pears, ... 1 00

October 23.

Gratuities:—

H. N. Grover, Lawrence Pears, ... 1 00
Robert Manning, Frederick Clapp Pears, ... 1 00
William Busbey, Pears, ... 1 00

CHRYSANTHEMUM SHOW.

November 10, 11, and 12.

French Premiums.

Apples.—Baldwin, T. B. Cowan, ... 5 00
Hubbardston, M. W. Chadbourne, ... 5 00

Society's Prizes.

Apples.—Baldwin, C. E. Grant,	3 00
Second, O. B. Hadwen,	2 00
Third, Warren Fenno,	1 00
Danvers Sweet, Charles N. Brackett,	3 00
Second, Warren Fenno,	2 00
Hubbardston, M. W. Chadbourne,	3 00
Second, Charles N. Brackett,	2 00
Third, C. E. Grant,	1 00
Hunt Russet, J. B. Moore & Son,	3 00
Second, William H. Hunt,	2 00
Third, Samuel Hartwell,	1 00
Lady's Sweet, William H. Hills,	3 00
The third prize to W. H. Teel,	1 00
Northern Spy, L. R. Eames,	3 00
Second, Warren Fenno,	2 00
Third, J. B. Moore & Son,	1 00
Rhode Island Greening, W. P. Plimpton,	3 00
Second, C. E. Grant,	2 00
Third, D. H. Brown,	1 00
Roxbury Russet, Cephas H. Brackett,	3 00
Second, T. B. Cowan,	2 00
Third, Mrs. M. T. Goddard,	1 00
Tolman's Sweet, A. J. Bigelow,	3 00
Second, J. T. Foster,	2 00
Third, W. P. Plimpton,	1 00
Tompkins King, George C. Rice,	3 00
Second, John Parker,	2 00
Third, W. C. Eustis,	1 00
Pears.—Angouleme, Varnum Frost,	4 00
Second, Mrs. H. P. Kendrick,	3 00
Third, S. G. Damon,	2 00
Fourth, W. S. Janvrin,	1 00
Anjou, Mrs. Mary Langmaid,	4 00
Second, Mrs. H. P. Kendrick,	3 00
Third, W. S. Janvrin,	2 00
Fourth, J. F. Newton,	1 00
Clairgeau, Mrs. Mary Langmaid,	3 00
Second, W. P. Plimpton,	2 00
Third, O. B. Hadwen,	1 00
Comice, Warren Fenno,	4 00
Second, W. P. Plimpton,	3 00
Third, S. G. Damon,	2 00
Fourth, Mrs. H. P. Kendrick,	1 00
Dana's Hovey, Mrs. Mary Langmaid,	4 00
Second, H. S. Goodwin,	3 00

Third, W. P. Plimpton,	$2 00
Fourth, Edwin A. Hall,	1 00
Diel, A. S. McIntosh,	3 00
Second, T. M. Davis,	2 00
Third, W. H. McIntosh,	1 00
Glout Morceau, Edwin A. Hall,	3 00
Second, Mrs. H. P. Kendrick,	2 00
Third, Mrs. Mary Gardner,	1 00
Josephine of Malines, John L. Bird,	3 00
Second Warren Fenno,	2 00
Third, Benjamin G. Smith,	1 00
Langelier, Edwin A. Hall,	3 00
Second, Jacob Eaton,	2 00
Third, T. M. Davis,	1 00
Lawrence, Mrs. H. P. Kendrick,	3 00
Second, A. McDermott,	2 00
Third, C. D. Fiske,	1 00
Vicar, Mrs. C. E. Wiggin,	3 00
Second, Mrs. H. P. Kendrick,	2 00
Third, William T. Hall,	1 00
Winter Nelis, S. Saunders,	3 00
Second, Edwin A. Hall,	2 00
Third, Mrs. H. P. Kendrick,	1 00
Any other variety, S. G. Damon, Marie Louise,	3 00
Second, Warren Fenno, Duchess of Bordeaux,	2 00
Third, Miss Mary Gardner, Columbia,	1 00

Gratuities:—

Samuel Hartwell, Apples,	2 00
L. R. Eames, "	1 00
J. B. White, Fameuse Apples,	1 00
Charles N. Brackett, Apples and Pears,	2 00
A. S. McIntosh, " " "	2 00
M. W. Chadbourne, " " "	2 00
Warren Fenno, " " "	2 00
William T. Hall, " " "	1 00
George W. Hall, " " "	1 00
S. Saunders, Winter Nelis Pears,	1 00
L. M. Chase, Pears,	1 00
C. M. Hovey, "	1 00
J. B. Moore & Son, Grapes,	1 00
S. G. Damon, "	1 00
S. G. Stone, "	1 00
F. Burr & Co., Foreign Grapes,	2 00
Robert Manning, Shell-bark Hickory Nuts,	1 00

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1886.

By CHARLES N. BRACKETT, CHAIRMAN.

As another of those distinctly marked periods by which we measure our existence and chronicle events will soon be numbered with those that have preceded it, it may be well to take a brief retrospective glance over the road we have travelled, and enquire what have been the most prominent features, and what the results of the various exhibitions which this department has made during the year. Such a review is often both instructive and encouraging, as we may not only learn from it what we have really accomplished, but, by reviewing the difficulties already overcome, we shall be better able to meet the obstacles that lie in our onward path. The period now just closing upon us has been one of progress in nearly all the departments of the farm and vegetable garden. The crops have generally been abundant, and the season has favored the harvest.

Nearly all of our most intelligent cultivators are now sensible that their profession is one which should be studied; that it is a profession in which the specially educated man occupies the same position of advantage that he does in every other pursuit of life. There is a better appreciation of the advantages to be derived from the application of scientific principles to our labor, and more disposition on the part of the cultivator of the soil to avail himself of such helps. The walls of prejudice have been modified or broken down by the introduction of labor-saving machines, or new methods of culture, once considered as useless innovations,

but found upon trial to be important and profitable changes. He has learned to think for himself — to see that a practice is not necessarily right because it is old; and he is more favorably disposed to the adoption of every useful improvement, and to at least a partial belief in the benefits to be derived from science. The importance of thorough cultivation and a liberal application of the proper fertilizers, the value of pure and reliable seeds, and the very great importance of the most approved system of forcing houses for the forwarding of vegetables out of season, are matters which have come to be pretty generally acknowledged; so that our horticultural exhibitions especially, and the larger markets to a certain extent, already show decided evidences of progress in the art of growing good vegetables, both in and out of season.

The prediction, made by your Committee in a former report, in regard to offering prizes for forced vegetables instead of depending on gratuities only (as was the custom previous to last year), has already been fulfilled. Never since the existence of the Society have there been so large and fine displays of these objects, as were to be seen on our tables the first Saturdays of January and February, the past season. The exhibits consisted of Cucumbers, Radishes, Lettuce, Mushrooms, Parsley, Tomatoes, Asparagus, Rhubarb, Dandelions, Chives, Water-cress, Mint, and several choice specimens of Celery—from thirteen different contributors. The result of these exhibitions has far exceeded the expectations of your Committee, and is without precedent. The first of these exhibitions occurred before the regular Schedule of Prizes for the year was published; and notwithstanding advance slips of the prize lists were printed and sent out by the Secretary to all who were thought likely to contribute, there were doubtless many who would otherwise have contributed, but were not reached by these notices.

At the weekly shows there has been a constantly increasing interest manifested; the exhibits have generally been of superior character, and in great variety. Competition, in most instances has been remarkably close, and quite a large number of new and constant contributors have been gained.

Asparagus.—The standard set by John B. Moore at our exhibitions, as a grower of this vegetable, has always been high. Indeed, as far back as we can remember, he has always made it a point that all the *first* prizes for this favorite vegetable should go to

Concord; and to his credit be it said that for more than twenty years he has succeeded in maintaining that point against all competitors. Apparently not satisfied with this — believing that the world moves, and desiring to move with it, he has the past season raised his standard a little higher still. His record now stands 4 lbs. 6¼ ozs. for one bunch of twelve stalks, that being the exact weight of one of the four bunches of Asparagus which he brought into our exhibition of May 22. We should most certainly dislike to say anything that might tend in any way to discourage other contributors from competing, but from present appearances it does really look to us as though that first prize would still travel over the same road for some time to come. Mr. Moore was awarded by your Committee a First Class Certificate of Merit for superior cultivation of Asparagus.

Peas.—Among the earliest specimens was a new variety shown by W. W. Rawson, June 12, under the name of Rawson's Clipper. It is a first early variety, with large well-filled pods, of a beautiful bright green color, the peas slightly wrinkled, and it certainly possessed many remarkably excellent properties which would seem to recommend it to the particular attention of the market gardener. This new pea was also exhibited on the same day by Samuel Hartwell. Maud S. was also shown at the same time by Warren Heustis & Son, and Samuel Hartwell. The Stratagem and American Wonder have again taken precedence, and must be set down as decidedly best in their respective classes.

Sweet Corn.—Cory's Early received the first prize July 17, and has taken precedence through the season whenever it has come into competition with the Marblehead, heretofore considered the earliest variety and largely grown for market purposes. The Cory is a decided improvement on that variety, being not only earlier, but also larger and of much better quality.

Tomatoes.— There has seldom, if ever, been as fine a display of this fruit, as on the occasion of our Annual Exhibition. There were fifty-five dishes in all, and competition was unusually brisk and close. The Committee, in making the awards, have rarely had their powers of discrimination so thoroughly tested. Those who recollect the character of the specimens which used to be seen on exhibition here only a few years ago, must have looked with unfeigned satisfaction upon the many fine specimens which have this year decked the tables at our exhibitions all through their sea-

son. The time was, and is not yet so far left behind as to be out of the remembrance of many of us, when it would have been difficult to find the tomato on sale in half a dozen markets in the whole country. At the present day, however, it is grown almost everywhere, and there are hundreds of acres devoted to its culture for the supply of Boston market alone.

In other useful branches of gardening, the last few years have also been years of progress. The cultivation of all the fine culinary vegetables has largely increased, and our markets are now almost everywhere abundantly supplied with them. The Egg Plant, Salsify, Okra, Mushroom, and Tomato, from being rarities, have now become almost universally cultivated.

Potatoes.— At the Annual Exhibition there were quite a large number of new varieties offered in competition for the Society's prizes, some of which as far as their outward appearance was concerned were certainly all that could be desired; but in regard to their *quality*, and the rank in which they should stand in this report, when compared with well known and standard sorts, your Committee were, on a first inspection, entirely in the dark. Under the usual system of judging on what one *sees*, the most important characteristic of a potato, *quality*, is wholly ignored. By this method, a committee can only certify by their awards as to what to them *looks* good, while it should be and is the aim of the Society to encourage the cultivation and growth of that only which actually *is* good. Your Committee were convinced that if they were able to report on the real quality of the different varieties placed before them for examination, the value of their report would be greatly enhanced, and therefore, at the Annual Exhibition this year, in order to make their awards fairly and understandingly, they adopted the quality test. Specimens of all varieties competing for premiums were cooked for trial, and the awards were made on this basis.

The new seedling potato from Albert Bresee which was favorably noticed in our last report (and which he has since named Leader) was again shown by him at the Annual Exhibition; and it fully sustained the favorable opinion formed of it by the Committee last year. It was exhibited for the first time at the Annual Exhibition in 1885; and was then entered by the originator for the Prospective Prize. Mr. Bresee presented specimens for trial, which were carefully tested by the Committee in

comparison with well known standard sorts, and were pronounced in quality superior to all. The Society's Silver Medal was awarded Mr. Bresee, for his new seedling potato, Leader.

The Committee would again call the attention of exhibitors to Rules 3 and 20 of the General Rules and Regulations, as under these rules they have, in several instances, been obliged to disqualify contributions, otherwise worthy, for having had more than the required number of speeimens, or more than one variety on the same dish. They would also caution contributors against running to the extreme in size, in selecting specimen potatoes, as seems to have been done in several instances at the Annual Exhibition. Medium, even-sized, smooth, and clean specimens are preferable for the table or for exhibition; and in making their awards the Committee will regard the above requisites as of more importance than overgrowth. We noticed, in one collection, several potatoes which had actually been pruned of prongs and excrescences, to bring them into proper shape, in order that they might be retained simply on account of their size. As the Committee is at present constituted, a resort to any such method of improving specimens, with the expectation of gaining a prize, is simply labor in vain.

Cauliflowers.— The principal exhibitors at the Annual Exhibition were W. W. Rawson, Samuel Hartwell, and W. H. Teel. The large and well grown specimens shown by these gentlemen fully sustained their well earned reputations as successful growers of the cauliflower. The First Special Prize was awarded to W. W. Rawson; who also received the Special Prize for the best collection of Seedling Potatoes — the Society's Silver Medal.

Celery.—The Special Prizes for Celery called out a larger number of competitors than usual. The specimens shown have never been excelled; and they formed a very interesting and attractive feature of the exhibition. The first prize was won by George Hill, and the second by W. W. Rawson.

Squashes, at the Annual Exhibition, were shown in less numbers than usual, although some of the specimens were of superior quality. The Hubbards and Turbans from W. W. Rawson, and Marrows from George Hill, were worthy of especial mention.

The various Root Crops have been exhibited in about the usual quantity and variety; and there has been nothing worthy of special mention for its novelty. As to quality, to particularize seems needless, for nearly every specimen on the tables at the Annual

Show was of superior merit, and exemplified to the practised eye, in a striking manner, the advantages which after a time result from these exhibitions, when they are conducted upon the right basis. In other words, the consequence of a continued series of exhibitions by a Society that awards its prizes with impartiality, and upon competent judgment, is almost certainly to develop in a community a high standard of excellence. When people are in the habit, week after week, of seeing fine vegetables or fruits upon the exhibition tables, they very soon come to require from the dealers that commodities of the same kind offered in the markets should bear an appearance similar to that of the superior specimens which they have so often seen on exhibition. Thus, through habitual exercise, the taste of all is improved and refined, and the public reap the benefit which naturally flows from this state of things.

The annexed list shows the amount awarded in premiums and gratuities to be $952, out of an appropriation of $1,030, leaving an unexpended balance of $78.

All of which is respectfully submitted.

For the Committee,

C. N. BRACKETT, *Chairman.*

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

January 2.

Radishes.— Four bunches of any variety, the second prize to George F. Stone,	$2 00
Cucumbers.— Pair of any variety, M. B. Hussey,	3 00
Lettuce.— Four heads of Tennisball, George F. Stone,	3 00
Parsley.— Two quarts, Warren Heustis & Son,	3 00
Second, George F. Stone,	2 00
Mushrooms.— Twenty-four specimens, Cephas H. Brackett,	3 00

Gratuities:—

Warren Heustis & Son, Celery,	2 00
Winter Brothers, Tomatoes,	1 00
Charles Winter, "	1 00

January 16.

Gratuities:—

George F. Stone, Lettuce and Parsley,	1 00
C. M. Hovey, Mushrooms,	1 00

January 23.

Gratuities:—

Cephas H. Brackett, Mushrooms and Cucumbers,	2 00
Mrs. Francis B. Hayes, Collection,	3 00

January 30.

Gratuities:—

Cephas H. Brackett, Cucumbers and Mushrooms,	2 00
Mrs. Francis B. Hayes, Asparagus,	1 00
Hittinger Brothers, Lettuce,	1 00

February 6.

Gratuities:—

Radishes.— Four bunches of any variety, O. F. Newhall, Long Scarlet,	3 00
Second, O. F. Newhall, Turnip Rooted,	2 00

Cucumbers.— Pair of any variety, Cephas H. Brackett, Brighton,	$3 00
Second, George H. Scott,	2 00
Third, F. C. Fisher, White Spine,	1 00
Dandelions.— Peck, Warren Heustis & Son,	3 00
Second, George F. Stone,	2 00
Lettuce.— Four heads of Tennisball, George F. Stone,	3 00
Second, Hittinger Brothers,	2 00
Mushrooms.— Twenty-four specimens, Cephas H. Brackett,	3 00
Second, C. M. Hovey,	2 00
Rhubarb.— Twelve stalks, Mrs. Francis B. Hayes, Seedling,	3 00
Second, " " " " Victoria,	2 00
Third, O. F. Newhall,	1 00

Gratuities:—

Warren Heustis & Son, Collection,	2 00
Mrs. Francis B. Hayes, "	2 00
Cephas H. Brackett, Cress and Chives,	2 00
S. Teel & Son, Celery,	1 00
O. F. Newhall, Asparagus,	1 00
Charles Winter, Tomatoes,	1 00
Winter Brothers, "	1 00
C. M. Hovey, "	1 00

February 13.

Gratuities:—

C. M. Hovey, Mushrooms and Tomatoes,	2 00
George F. Stone, Lettuce,	1 00
Mrs. Francis B. Hayes, Rhubarb,	1 00
W. W. Rawson, Radishes,	1 00

February 20.

Gratuities:—

Cephas H. Brackett, Cucumbers and Mushrooms,	2 00
Warren Heustis & Son, Radishes,	1 00
W. W. Rawson, "	1 00
Mrs. Francis B. Hayes, Asparagus,	1 00

February 27.

Gratuities:—

W. W. Rawson, Lettuce and Radishes,	1 00
George F. Stone, "	1 00

March 6.

Gratuities:—

Warren Heustis & Son, Celery and two varieties of Radishes,	2 00
Cephas H. Brackett, Collection,	2 00

MARCH 13.

Gratuity:—

W. W. Rawson, Lettuce, ... $1 00

MARCH 20.

Gratuity:—

W. W. Rawson, Lettuce and Radishes, ... 2 00

SPRING EXHIBITION.

MARCH 24, 25, AND 26.

RADISHES.— Four bunches of Turnip Rooted, W. W. Rawson, . $3 00
Second, Josiah Crosby, ... 2 00
Third, George F. Stone, ... 1 00
CUCUMBERS.— Pair of White Spine, Cephas H. Brackett, . . 3 00
Second, George H. Scott, ... 2 00
Third, F. C. Fisher, ... 1 00
CELERY.— Four roots, Warren Heustis & Son, Henderson's Dwarf, 3 00
Second, " " " Boston Market, . 2 00
DANDELIONS.— Peck, Josiah Crosby, ... 3 00
Second, Warren Heustis & Son, ... 2 00
Third, George F. Stone, ... 1 00
LETTUCE.— Four heads, Josiah Crosby, ... 3 00
Second, George F. Stone, ... 2 00
Third, C. A. Learned, ... 1 00
PARSLEY.— Two quarts, George E. Sanderson, ... 2 00
Second, George F. Stone, ... 1 00
RHUBARB.— Twelve stalks, C. W. Winn, ... 3 00
Second, Cephas H. Brackett, ... 2 00
Third, E. L. Saunders, ... 1 00
TOMATOES.— Twelve, A. R. Howe, ... 3 00
Second, Charles Winter, ... 2 00
Third, W. C. Winter, ... 1 00

Gratuities:—

Winn, Ricker, & Co., Onions, ... 1 00
C. W. Winn, Mint, ... 1 00
Cephas H. Brackett, Mushrooms, ... 1 00
Warren Heustis & Son, " 1 00

APRIL 3.

Gratuities:—

Mrs. Francis B. Hayes, Potatoes (forced), ... 2 00
Josiah Crosby, Lettuce, ... 1 00

APRIL 10.

ASPARAGUS.— Two bunches, twelve stalks each, Cephas H. Brackett,	$3 00
Second, O. F. Newhall,	2 00
CUCUMBERS.— Pair of White Spine, Cephas H. Brackett,	3 00
Second, James Heslan,	2 00
Third, George H. Scott,	1 00
Any other variety, C. H. Brackett, Brighton,	3 00
MUSHROOMS.— Twenty-four specimens, Cephas H. Brackett,	3 00
Second, Warren Heustis & Son,	2 00
Gratuities:—	
Warren Heustis & Son, Collection,	2 00
Cephas H. Brackett, Tomatoes,	1 00
C. W. Winn, Rhubarb,	1 00

APRIL 17.

Gratuities:—	
Josiah Crosby, Collection,	2 00
Edwin Sheppard, Cucumbers,	1 00

APRIL 24.

Gratuities:—	
W. W. Rawson, Collection,	2 00
Mrs. Francis B. Hayes, Potatoes,	1 00

MAY 1.

Gratuities:—	
John B. Moore & Son, Asparagus,	1 00
Cephas H. Brackett, Tomatoes,	1 00
Josiah Crosby, Egyptian Beets,	1 00
Warren Heustis & Son, Collection,	2 00

MAY EXHIBITION.

MAY 8.

ASPARAGUS.—Four bunches, twelve stalks each, J. B. Moore & Son,	$3 00
Second, L. G. Weston,	2 00
Third, Samuel Hartwell,	1 00
CUCUMBERS.—Pair, grown under glass, Cephas H. Brackett, Brighton,	3 00
Second, Varnum Frost, White Spine,	2 00
Third, Cephas H. Brackett, " "	1 00
SPINACH.—Peck, Warren Heustis & Son, Thick Leaved,	3 00
Second, " " " " Arlington,	2 00

DANDELIONS.—Peck, Warren Heustis & Son, ... $2 00
Second, George F. Stone, ... 1 00
LETTUCE.—Four heads, George F. Stone, ... 3 00
RHUBARB.—Twelve stalks, Cephas H. Brackett, Victoria, . . 3 00
Second, Samuel Hartwell, " . . 2 00
Third, M. W. Chadbourne, " . . 1 00

Gratuities:—

Cephas H. Brackett, Tomatoes and Mushrooms, ... 2 00
Josiah Crosby, Beets and Radishes, ... 2 00
Warren Heustis & Son, Radishes, ... 1 00

MAY 15.

Gratuities:—

Mrs. Francis B. Hayes, Lettuce and Rhubarb, ... 2 00
Edwin Sheppard, Cucumbers, ... 2 00
Samuel Hartwell, Rhubarb and Asparagus, ... 2 00
Warren W. Rawson, Cucumbers, ... 1 00
John B. Moore & Son, Asparagus (weight of 12 stalks, 3 lbs. 4½ ozs.), ... 1 00

MAY 22.

Gratuities:—

Cephas H. Brackett, Collection, ... 2 00
John B. Moore & Son, Asparagus (weight of 12 stalks, 4 lbs. 6¼ ozs.,) First Class Certificate of Merit, for superior cultivation.
C. D. Tuttle, Asparagus, ... 1 00

MAY 29.

Gratuities:—

W. W. Rawson, Cauliflowers, ... 2 00
Samuel Hartwell, Asparagus, ... 1 00

RHODODENDRON SHOW.

JUNE 5.

BEETS.—Twelve specimens, Josiah Crosby, Egyptian, . . . $3 00
Second, Warren Heustis & Son, Egyptian, ... 2 00
Third, Warren Heustis & Son, Bastian, ... 1 00
RADISHES.—Four bunches, Josiah Crosby, ... 3 00
Second, C. A. Learned, ... 2 00
Third, Warren Heustis & Son, ... 1 00
ASPARAGUS.—Four bunches, twelve stalks each, J. B. Moore & Son, 3 00
Second, L. W. Weston, ... 2 00
Third, C. D. Tuttle, ... 1 00

Cucumbers.—Pair, W. W. Rawson,	$3 00
Second, Cephas H. Brackett, White Spine,	2 00
Third, " " " Brighton,	1 00
Lettuce.—Four heads, C. A. Learned,	3 00
Second, Warren Heustis & Son,	2 00
Third, George F. Stone,	1 00
Rhubarb.—Twelve stalks, J. B. Moore & Son,	3 00
Second, Benjamin G. Smith,	2 00
Third, Samuel Hartwell,	1 00
Mushrooms.—Twenty-four specimens, Cephas H. Brackett,	3 00

Gratuities:—

Edwin Sheppard, Cucumbers,	1 00
Cephas H. Brackett, Tomatoes,	1 00
W. W. Rawson, Cauliflowers,	1 00

June 12.

Gratuities:—

W. W. Rawson, Rawson's Clipper Peas,	2 00
Samuel Hartwell, " " and Maud S. Peas,	1 00
Warren Heustis & Son, Maud S. Peas,	1 00

ROSE AND STRAWBERRY EXHIBITION.

June 22.

Beets.—Twelve Summer Turnip Rooted, C. A. Learned,	$3 00
Second, Warren Heustis & Son,	2 00
Egyptian, C. A. Learned,	2 00
Second, Josiah Crosby,	1 00
Onions.—Twelve, Josiah Crosby,	2 00
Second, C. A. Learned,	1 00
Cucumbers.—Pair of White Spine, Hittinger Brothers,	2 00
Second, Warren Heustis & Son,	1 00
Cabbages.—Three, C. A. Learned,	3 00
Second, W. W. Rawson,	2 00
Third, W. Heustis & Son,	1 00
Lettuce.—Four heads of any variety, C. A. Learned,	2 00
Second, E. Moore,	1 00
Peas.—Half-peck of any variety, W. W. Rawson,	3 00
Second, Samuel Hartwell,	2 00
Third, Charles N. Brackett,	1 00

Gratuities:—

Hittinger Brothers, Tomatoes,	1 00
W. Nicholson, "	1 00
W. C. Winter, "	1 00

J. B. Moore & Son, Rhubarb, ... $1 00
W. W. Rawson, Radishes, ... 1 00
C. A. Learned, Wakefield Cabbages, ... 1 00
M. W. Chadbourne, Peas, ... 1 00
Samuel Hartwell, " 1 00

JULY 3.

ONIONS.—Twelve, Josiah Crosby, ... 2 00
Second, C. A. Learned, ... 1 00
SQUASHES.—Four Long Warted, George Hill, ... 2 00
Second, Josiah Crosby, ... 1 00
Four Scalloped, George Hill, ... 2 00
CABBAGES.—Three, W. W. Rawson, ... 3 00
Second, C. A. Learned, Henderson's, ... 2 00
Third, " " " Fottler's, ... 1 00
PEAS.—Half-peck of American Wonder, Samuel Hartwell, . . 3 00
Second, W. W. Rawson, ... 2 00
Any other variety, Charles N. Brackett, Telephone, . . . 3 00
Second, W. W. Rawson, ... 2 00
Third, Samuel Hartwell, Advancer, ... 1 00

Gratuities:—

Hittinger Brothers, Collection, ... 2 00
George Hill, Wax Beans, ... 1 00
W. Heustis & Son, Cabbages, ... 1 00
Cephas H. Brackett, Potatoes and Tomatoes, ... 2 00
W. W. Rawson, Lettuce, ... 1 00

JULY 10.

POTATOES.—Twelve specimens, Cephas H. Brackett, Hebron, . 3 00
Second, C. D. Kingman, Chicago Market, ... 2 00
Third, C. B. Lancaster, Clark, ... 1 00
BEANS.—Half-peck of String, Charles N. Brackett, Cranberry, . 3 00
Second, Warren Heustis & Son, Wax, ... 2 00
Third, " " " " Mohawk, ... 1 00
PEAS.—Half-peck of any variety, William Patterson, Stratagem, . 3 00
Second, Samuel Hartwell, " . 2 00
Third, Charles N. Brackett, American Wonder, . . . 1 00

JULY 17.

CABBAGES.—Three Drumhead, Warren Heustis & Son, . . . 3 00
BEANS.—Half peck of Cranberry, Charles N. Brackett, . . . 2 00
PEAS.—Half peck of any variety, Charles N. Brackett, Stratagem, 3 00
Second, W. W. Rawson, Advancer, ... 2 00
Third, " " " Stratagem, ... 1 00

Sweet Corn.—Twelve ears, Charles N. Brackett, Cory,	$3 00
Second, Samuel Hartwell,	2 00
Tomatoes.—Twelve specimens, George Hill,	3 00
Second, Hittinger Brothers,	2 00
Third, W. W. Rawson,	1 00

Gratuities:—

W. W. Rawson, Wax Beans and Squashes,	2 00
Hittinger Brothers, Wax Beans,	1 00
S. Lawrence, Stratagem Peas,	1 00

July 24.

Potatoes.—Twelve specimens, Samuel Hartwell, Sunrise,	3 00
Second, Samuel Hartwell, Hebron,	2 00
Third, C. B. Lancaster, Clark,	1 00
Squashes.—Three Marrow, Josiah Crosby,	3 00
Sweet Corn.—Twelve ears, Charles N. Brackett, Cory,	3 00
Second, Samuel Hartwell, Cory,	2 00
Third, " " Marblehead,	1 00
Tomatoes.—Twelve specimens, George Hill,	3 00
Second, Samuel Hartwell, Gen. Grant,	2 00

Gratuities:—

Hittinger Brothers, Tomatoes,	1 00
L. W. Weston, Potatoes and Corn,	1 00
M. W. Chadbourne, " " "	1 00
Charles N. Brackett, Peas,	1 00

July 31.

Potatoes.—Twelve of any variety, Samuel Hartwell, Sunrise,	3 00
Second, Samuel Hartwell, Hebron,	2 00
Third, C. B. Lancaster, Clark,	1 00
Squashes.—Three Marrow, Josiah Crosby,	3 00
Peas.—Half-peck of any variety, Warren Heustis & Son,	3 00
Second, Charles N. Brackett,	2 00
Sweet Corn.—Twelve ears, Samuel Hartwell, Parker House,	3 00
Second, Charles N. Brackett, Cory,	2 00
Third, L. W. Weston,	1 00
Tomatoes.—Twelve specimens, Charles N. Brackett, Acme,	3 00
Second, Hittinger Brothers, Perfection,	2 00
Third, George F. Stone, Acme,	1 00

Gratuities:—

Samuel Hartwell, Collection,	2 00
Charles N. Brackett, "	2 00
L. W. Weston, Bliss's Triumph Potatoes,	1 00

AUGUST 7.

GREENFLESH MELONS.—Four specimens, George Hill,	$3 00
Second, C. A. Learned,	2 00
Third, George Hill,	1 00
BEANS.—Half-peck of Horticultural, Samuel Hartwell,	3 00
TOMATOES.—Twelve specimens of Acme, Charles N. Brackett,	3 00
Second, George F. Stone,	2 00
Emery, Charles N. Brackett,	3 00
Second, Samuel Hartwell,	2 00
Any other variety, Hittinger Brothers, Perfection,	3 00
Second, Charles N. Brackett, Cardinal,	2 00
Third, Samuel Hartwell, Perfection,	1 00

Gratuities:—

Samuel Hartwell, Collection,	2 00
J. G. Coolidge, Goddard Beans,	1 00
Isaac E. Coburn, Beans,	1 00

AUGUST 14.

SWEET CORN.—Twelve ears, Samuel Hartwell,	3 00
Second, J. G. Coolidge,	2 00
Third, C. E. Grant,	1 00
EGG PLANT.—Four specimens of Round Purple, the second prize to J. G. Coolidge,	1 00

Gratuities:—

Samuel Hartwell, Collection,	3 00
Charles N. Brackett, "	2 00
C. E. Grant, "	1 00
Cephas H. Brackett, Cucumbers and Mushrooms,	1 00

AUGUST 21.

POTATOES.—Twelve specimens of any variety, C. B. Lancaster,	3 00
Second, Warren Heustis & Son,	2 00
Third, L. W. Weston,	1 00
MELONS.—Sweet, any variety, four specimens, Warren Heustis & Son,	3 00
Second, George Hill,	2 00
Third, W. W. Rawson,	1 00
BEANS.—Two quarts of Large Lima, Benjamin G. Smith,	3 00
Second, Samuel Hartwell,	2 00
Horticultural, Warren Heustis & Son,	3 00
Second, Samuel Hartwell,	2 00
PEPPERS.—Twelve specimens, Charles N. Brackett,	3 00

Gratuities:—

Samuel Hartwell, Collection,	$3 00
C. A. Learned, "	2 00
Charles N. Brackett, "	2 00
C. E. Grant, "	2 00
W. W. Rawson, Lettuce,	1 00

AUGUST 28.

WATERMELONS.—Pair, C. E. Grant,	3 00
GREENFLESH MELONS.—Four specimens, Warren Heustis & Son,	3 00
Second, George Hill,	2 00
BEANS.—Two quarts of Goddard, shelled, Charles N. Brackett,	3 00
Second, Warren Heustis & Son,	2 00
Third, Samuel Hartwell,	1 00
PEPPERS.—Twelve specimens, Charles N. Brackett,	3 00
Second, C. A. Learned,	2 00
Third, C. Terry,	1 00

Gratuities:—

Samuel Hartwell, Collection,	3 00
C. A. Learned, "	2 00
Charles N. Brackett, Corn and Tomatoes,	2 00
C. E. Grant, " " "	1 00

SEPTEMBER 4.

CABBAGES.—Three specimens of any variety, C. B. Lancaster,	3 00
Second, Samuel Hartwell,	2 00
CAULIFLOWERS.—Four specimens, Samuel Hartwell, Erfurt,	3 00
Second, Samuel Hartwell, Snowball,	2 00
Third, " " Sea Foam,	1 00
CELERY.—Four roots, H. F. Reynolds, Golden Yellow,	3 00
Second, " " " Crawford,	2 00
Third, " " " White Plume,	1 00
BEANS.—Two quarts of Large Lima, Benjamin G. Smith,	3 00
Second, Charles N. Brackett,	2 00
Third, Mrs. Francis B. Hayes,	1 00

Gratuities:—

Charles N. Brackett, Collection,	3 00
C. E. Grant, "	2 00
Mrs. Francis B. Hayes, "	1 00
Samuel Hartwell, "	1 00

ANNUAL EXHIBITION.

SEPTEMBER 14, 15, 16, AND 17.

Special Prizes.

POTATOES.— Collection of new seedling varieties, W. W. Rawson, the Society's Silver Medal.

CAULIFLOWERS.— Best four specimens, W. W. Rawson, . . . $6 00
Second, Samuel Hartwell, ... 4 00

CELERY.—Best four roots, George Hill, ... 10 00
Second, W. W. Rawson, ... 5 00

Regular Prizes.

BEETS.—Twelve Turnip Rooted, George F. Stone, ... 3 00
Second, W. W. Rawson, ... 2 00
Third, C. A. Learned, ... 1 00

CARROTS.—Twelve Long Orange, W. W. Rawson, ... 3 00
Twelve Intermediate, W.W. Rawson, ... 3 00
Second, Mrs. M. T. Goddard, ... 2 00
Third, Warren Heustis & Son, ... 1 00

PARSNIPS.— Twelve Long, C. A. Learned, ... 3 00
Second, W. W. Rawson, ... 2 00
Third, Mrs. M. T. Goddard, ... 1 00

POTATOES.— Four varieties, twelve specimens each, H. B. Watts, . 5 00
Second, Charles N. Brackett, ... 4 00
Third, L. W. Weston, ... 3 00
Clark, Samuel Hartwell, ... 3 00
Mrs. M. T. Goddard, ... 2 00
Hebron, H. B. Watts, ... 3 00
Second, L. W. Weston, ... 2 00
Third, Samuel Hartwell, ... 1 00
Rose, Mrs. M. T. Goddard, ... 3 00
Second, Mrs. F. B. Hayes, ... 2 00
Savoy, Mrs. M. T. Goddard, ... 3 00
Second, C. D. Tuttle, ... 2 00
Third, Samuel Hartwell, ... 1 00
Any other variety, Mrs. M. T. Goddard, King, ... 3 00
Second, Francis Smith, Winslow's Seedling, ... 2 00
Third, Samuel Hartwell, Charter Oak, ... 1 00

SALSIFY.—Twelve roots, Charles F. Curtis, ... 3 00
Second, M. W. Chadbourne, ... 2 00
Third, Warren Heustis & Son, ... 1 00

TURNIPS.—Twelve Flat, Charles N. Brackett, ... 3 00
Second, George F. Stone, ... 2 00
Third, C. B. Lancaster, ... 1 00
Swedish, Mrs. M. T. Goddard, ... 3 00

Onions.—Twelve Danvers, C. A. Learned,	$3 00
Second, George Hill,	2 00
Third, Warren Heustis & Son,	1 00
Portugal, George Hill,	3 00
Second, Josiah Crosby,	2 00
Red, George Hill,	3 00
Greenflesh Melons.—Four, Warren Heustis & Son,	3 00
Second, Samuel Hartwell,	2 00
Third, John B. Moore & Son,	1 00
Watermelons.—Pair, Charles N. Brackett,	3 00
Second, C. E. Grant,	2 00
Third, Samuel Hartwell,	1 00
Squashes.—Four Canada, Warren Fenno,	3 00
Second, Josiah Pratt,	2 00
Third, Mrs. M. T. Goddard,	1 00
Hubbard, W. W. Rawson,	3 00
Second, George Hill,	2 00
Third, Samuel Hartwell,	1 00
Marrow, George Hill,	3 00
Second, Warren Heustis & Son,	2 00
Third, W. W. Rawson,	1 00
Turban, W. W. Rawson,	3 00
Second, Mrs. M. T. Goddard,	2 00
Cabbages.—Three Drumhead, C. B. Lancaster,	3 00
Second, Samuel Hartwell,	2 00
Third, Mrs. M. T. Goddard,	1 00
Red, Mrs. M. T. Goddard,	3 00
Second, C. B. Lancaster,	2 00
Third, Charles N. Brackett,	1 00
Savoy, Samuel Hartwell,	3 00
Second, C. B. Lancaster,	2 00
Third, Mrs. M. T. Goddard,	1 00
Cauliflowers.—Four, W. H. Teel,	3 00
Second, Samuel Hartwell,	2 00
Third, W. W. Rawson,	1 00
Celery.—Four roots of Boston Market, Josiah Crosby,	4 00
Second, Warren Heustis & Son,	3 00
Any other variety, George Hill, Arlington,	4 00
Second, W. W. Rawson, Arlington,	3 00
Third, H. F. Reynolds, White Plume,	2 00
Horseradish.—Six roots, W. W. Rawson,	3 00
Second, C. A. Learned,	2 00
Beans.—Two quarts of Lima, Benjamin G. Smith,	3 00
Second, Charles N. Brackett,	2 00
Third, C. E. Grant,	1 00
Corn.—Twelve ears of Sweet, Charles N. Brackett,	3 00
Second, W. Heustis & Son,	2 00

Third, Miss A. Tornberg,	$1 00
Yellow or Field, twenty-five ears, traced, Mrs. M. T. Goddard,	3 00
Second, Horace Eaton,	2 00
Egg Plants.—Four Round Purple, J. G. Coolidge,	3 00
Second, C. A. Learned,	2 00
Third, W. W. Rawson,	1 00
Tomatoes.—Three varieties, twelve specimens each, I. E. Coburn,	5 00
Second, George Hill,	4 00
Third, Charles N. Brackett,	3 00
Acme, J. Brierly,	3 00
Second, C. E. Grant,	2 00
Third, Samuel Hartwell,	1 00
Emery, George Hill,	3 00
Second, M. B. Faxon,	2 00
Third, I. E. Coburn,	1 00
Paragon, Charles N. Brackett,	3 00
Second, C. E. Grant,	2 00
Third, George Hill,	1 00
Perfection, George Hill,	3 00
Second, Samuel Hartwell,	2 00
Third, C. E. Grant,	1 00
Any other variety, I. E. Coburn, Favorite,	3 00
Second, Charles N. Brackett, Cardinal,	2 00
Third, William H. Spooner, Cardinal,	1 00
Martynias.—Twenty-four, Starkes Whiton,	3 00
Second, M. W. Chadbourne,	2 00
Peppers.—Twenty-four, Charles N. Brackett,	3 00
Second, C. A. Learned,	2 00
Third, Sidney Lawrence,	1 00

Gratuities:—

Warren Heustis & Son, Melons,	1 00
L. W. Weston, Melons,	1 00
George W. Jameson, Watermelons,	1 00
Samuel Hartwell, "	1 00
Cephas H. Brackett, Muskmelons,	1 00
Horace Eaton, Squashes,	1 00
A. H. Dunlap, "	1 00
Patten & Co., Cucumbers,	1 00
Miss A. Tornberg, Kohl Rabi,	1 00
E. J. Bliss, Brussels Sprouts,	1 00
Charles N. Brackett, Red Sweet Corn,	1 00
C. A. Learned, Lettuce,	1 00
W. W. Rawson, "	1 00
C. E. Grant, Collection,	3 00
Mrs. Francis B. Hayes, Collection,	2 00

Albert Bresee, for new seedling potato Leader, the Society's Silver Medal.

OCTOBER 2.

SALSIFY.—Twelve specimens, Charles F. Curtis,	$3 00
SQUASHES.—Three Hubbard, J. G. Coolidge,	3 00
Second, Samuel Hartwell,	2 00
CABBAGES.—Three Drumhead, Samuel Hartwell,	3 00
Second, Mrs. M. T. Goddard,	2 00
Third, Charles N. Brackett,	1 00
Red, Charles N. Brackett,	3 00
Second, Mrs. M. T. Goddard,	2 00
Third, Samuel Hartwell,	1 00
Savoy, Samuel Hartwell,	3 00
CAULIFLOWERS.—Four, W. H. Teel,	3 00
Second, Samuel Hartwell, Erfurt,	2 00
Third, Samuel Hartwell, Snowball,	1 00
CELERY.—Four roots of Boston Market, Warren Heustis & Son,	4 00
The third prize to Mrs. C. M. Hammond,	2 00
Any other variety, George Hill, Arlington,	4 00

Gratuities:—

Charles N. Brackett, Collection,	4 00
C. E. Grant, Collection,	3 00
Samuel Hartwell, Melons,	2 00
I. E. Coburn, Tomatoes,	1 00
M. W. Chadbourne, Salsify,	1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 10, 11, AND 12.

ONIONS.—Twelve, C. A. Learned,	$3 00
Second, W. S. Janvrin,	2 00
Third, Warren Heustis & Son,	1 00
CUCUMBERS.—Pair, Cephas H. Brackett, Brighton,	3 00
Second, F. C. Fisher,	2 00
Third, Cephas H. Brackett,	1 00
CABBAGES.—Three Red, Charles N. Brackett,	3 00
Savoy, Samuel Hartwell,	3 00
CAULIFLOWERS.—Four specimens, W. H. Teel,	3 00
CELERY.—Four roots, W. W. Rawson,	3 00
Second, Varnum Frost,	2 00
Third, Josiah Crosby,	1 00
ENDIVE.—Four specimens, W. A. Manda, Broad Leaved,	3 00
Second, W. A. Manda, French Curled,	2 00

Gratuities:—

Samuel Hartwell, Collection,	$1 00
W. A. Manda, Leeks,	1 00
C. E. Grant, Melons,	1 00
George Sanderson, Parsley,	1 00
Cephas H. Brackett, Tomatoes,	1 00
A. S. McIntosh, Artichokes,	1 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1886.

By JOHN G. BARKER, CHAIRMAN.

In submitting our report for the past season, we trust it will not be devoid of interest to the Society, although we have to report no competition for any of the various premiums offered, except those for vineyards. We have tried to offer such prizes as would be sure to bring forward competitors, but regret to say that in this particular we have been disappointed. We still cherish the hope that those who are fortunate enough to possess places or objects worthy of notice will not fail to call the attention of the Committee to them. It is true the prizes offered always relate to some especial object; still it is not intended to debar from the Committee's inspection everything except matters especially named. On the contrary we shall always be glad to embrace in our report anything that is of interest to the Society and will advance the interests of horticulture; and we sincerely hope for a more hearty co-operation on the part of the members than it has been our lot to enjoy in the past. We also invite your attention to some slight changes in the Schedule of Prizes.

OAKMOUNT, THE RESIDENCE OF MRS. FRANCIS B. HAYES.

Our first visit of the year was made at the grounds of our late President, the Hon. Francis B. Hayes, the especial object being to see the very fine display of Rhododendrons. We have made

so frequent mention of visits to this place that little can here be said by way of addition to our former reports. The Rhododendron tent has been largely increased in size, and many fine varieties have been added to the already extensive collection. It is gratifying to remark, in this community, a more general desire to cultivate these valuable decorative plants; which are certainly among the most beautiful means of adorning grounds. Many a northern exposure, now barren and wild, could be beautified by the use of the rhododendron. There are no ornamental plants that will pay for the care and attention given them better than rhododendrons; let the work be done well at first, and the attention they require afterward is but little.

The spacious dwelling in process of erection at our last visit is now completed and has the appearance of an English mansion house, being built of natural stone collected on the place; while its location, well back from the entrance and surrounded by the native forest, gives it a very picturesque and attractive setting.

Grounds of Charles S. Sargent.

Our second visit was at Mr. C. S. Sargent's; his beautiful estate, situated in the charming town of Brookline, is well known to nearly all the members of the Society, very many having enjoyed frequent visits there. We were received most heartily at the residence of Mr. Sargent, and enjoyed very much the cordial reception given us there, as well as the opportunity for a reunion and further acquaintance with other guests of the occasion.

In a niche at the rear of the house on a broad piazza, and facing the lawn, a tent was erected, which was well filled with an excellent collection of Indian Azaleas, of the finest varieties and all in flower. The multitude of fine specimens, comprising almost every shade of color, formed a beautiful exhibition in itself. We regret to record the death of the splendid specimen of Decora, which has been frequently shown at the exhibitions of the Society, and was one of the finest plants ever known.

While admiring this beautiful collection of plants we wondered why more of them are not cultivated; especially considering with what ease they can be grown, and how conveniently they can be controlled as regards their time of flowering, by keeping them back, when desired, in a temperature of 40° to 45° — the same as

is required for the Sikkim varieties of the Rhododendron. In such places many of the best collections of rhododendrons and azaleas in this vicinity are kept. A good clean cellar does well; or if this be not at hand a pit or a cool greenhouse will answer every purpose.

There were also fine specimens of rhododendrons in pots and tubs, which were very beautiful, both in foliage and flower. Other specimen plants were placed in intermediate positions on the balustrade and around the piazza, the Agaves and *Beaucarnea recurvata* being particularly noticeable. In a quiet nook between the piazza and a wing of the house was planted a bed of pansies with a broad band of daisies, which gave us a pleasant surprise at a moment when we were not looking for or expecting anything. How many such little nooks, now neglected, could be made attractive with trifling expense!

While we were on the piazza we enjoyed a delightful view of the lawn with its beautiful undulating surface. It has often been said that the charm of a place is a well kept lawn; on this view of things Mr. Sargent's most certainly possesses the charm. It is pleasing to notice that the natural contours have been maintained, and that the foolish rage for levelling every spot has not prevailed. We also gladly call attention to the beautiful views in all directions, the frequency of which is rather remarkable; look which way you will, at every glance some fine view in the distance will greet you, the effect of which is charming. The openings giving these views afford also the breadth of light and shade so desirable in a well arranged place, and still so seldom attained. We are led to make especial mention of the foregoing points, as all our party were very much interested in these delightful views.

It is needless to dilate upon the beauty of the trees and shrubs on these grounds; good results only are to be expected where such skill has been given to the selection and care of fine specimens of the rarest and choicest kinds. Amongst those which adorn the estate are many fine specimens of single trees, especially of evergreens. By being placed at a distance from the groups of deciduous trees and shrubs, they are made to afford a very pleasing contrast as regards form and color.

A very beautiful feature in these grounds is the flowering shrubs; of which some writer has said that they are the choicest gifts of Nature to the landscape gardener, and on this point I am sure

we shall not differ from him. We found them here displayed to good advantage — not planted so thickly as they are often seen, so as to become entangled with each other, and make the position of each single plant difficult to be found; but each plant and shrub, whether singly or in a group, formed a specimen by itself. Each had been so planted that the grouping has not been lost; and yet they are not so close to each other that the idea of specimens is not maintained. Indeed, all are so well arranged that they give a finished appearance to the whole scene.

Among the trees and shrubs we noticed fine specimens of *Abies alba*, *A. excelsa*, *Picea pungens*, and many other fine evergreens; also *Syringa Japonica*, *Viburnum opulus*, *Deutzia parviflora*, *Viburnum plicatum*, *Acer polymorphum atropurpureum dissectum*, Japan Weeping Cherry, Paul's Thorns, and unusually good specimens of *Aquilegia cœrulea*.

In garden scenery, water, in whatever shape, has an enlivening effect; here is found a large pond of sufficient dimensions to add greatly to the delightfulness of the place; a part of the margin of which is left in a natural state, while another part displays a wide border of rhododendrons containing many hundred plants — all in the healthiest condition and blooming finely. The importance of giving these valuable plants a conspicuous place is fully recognized in the arrangement here referred to; and their great value as decorative plants can hardly be overestimated, as the fine array of distinct varieties gave ample proof. Perhaps the reflection of this delightful bed of rhododendrons in the water — a picture more easily enjoyed than described—was quite as pleasing to many of the visitors as the direct view. We also noticed very many varieties of Lilies planted in the rhododendron bed, many of them throwing up enormous spikes of flowers. A fine collection of named herbaceous plants added to the interest of the place.

The greenhouses contained many specimens of plants both rare and well known, all in the best possible condition — indeed, the whole place was in excellent order. To qualify one to give, in detail, an idea of the many choice trees, shrubs, and plants which we witnessed on every hand, would take more time than our brief visit allowed for the purpose. Much has doubtless gone unmentioned which we should desire to take note of in order to afford that more adequate description of Mr. Sargent's place which we feel is due to him. We may here record, however, the great satis-

faction afforded us by this visit to his very interesting place, not alone on account of the pleasure it gave the Committee, but for the profit and instruction gained thereby.

GROUNDS OF WARREN HEUSTIS & SON, BELMONT.

Our next visit was upon the invitation of Messrs. Warren Heustis & Son; the especial object being to see the new Belmont Strawberry raised by these gentlemen. The production of a strawberry better than heretofore grown, or even as good as many that can be found in the market, is an object worthy of our best attention. The Belmont is not new to many of us; but has been on our exhibition tables several years, and has very deservedly attracted our attention and interest.

The area of the beds on which were growing the plants that we were invited to examine was a little more than 25,000 square feet; and from these beds there has been sold in plants and fruit about $4,000 worth; or, separating the items, about $3,000 has been received for plants sold, and for berries from $900 to $1,000; not including a large quantity used for home purposes.

Messrs. Heustis & Son have received very large orders for plants from parties who have only seen the berries in the market and required no further evidence of their excellence. One of the dealers who has disposed of their crop, in a conversation with the Chairman of the Committee, gave assurance of the great value of this variety; and spoke especially of its keeping qualities, saying that it remained in good condition much longer than any other that he knew of. It is seldom that one sees a strawberry producing ripe and small green fruit at the same time, as does the Belmont—thus giving evidence of being a remarkably productive variety. Few strawberries possess a combination of so many good qualities as are found in the Belmont; and, whether for the amateur or the marketman, it is certainly a very desirable variety. The flavor is good and the substance rich and melting, whether picked and eaten from the vine or used at the tables.

A good strawberry will always be held in high esteem, for it is a wholesome, health-giving fruit, as well as the earliest in season. The fact that new varieties are constantly coming out is an indication of the rapid progress now making in this important branch of horticulture; but there will be no mistake in placing the Belmont high on the list of new varieties, as one of the very best.

Vineyards.

No premiums ever offered by the Society in the Garden Committee's department have been so well competed for as those for the culture of Grapes.

We received invitations to visit the vineyards of A. J. Bigelow of Marlboro; G. B. Andrews, Pearl Hill Farm, Fitchburg; E. C. Rice, Sunderland; and Henry Derby, Concord. The applications of the two gentlemen last named came too late for competition, according to the rules.

While on our way to Mr. Andrews's we took a hurried glance at the vineyard of Dr. Jabez Fisher; who gave us a very cordial reception. To say that his vineyard is a model of neatness and successful cultivation is only repeating what we all have often heard. The fine condition of his vines and the very even and excellent crop of fruit gave abundant evidence that a master workman had bestowed upon them his best efforts. We hope at some future time to be able to lay before the Society a more extended account of this fine vineyard.

The statements of Mr. Andrews and Mr. Bigelow, here included, will be quite sufficient to bring out their ideas of vine culture without any introductory remarks.

Statement of George B. Andrews.

Fitchburg, September 16, 1886.

John G. Barker, Chairman of the Committee on Gardens, Massachusetts Horticultural Society:—

Dear Sir:

At your request I submit to your Committee the following statement concerning my vineyard. The vineyard that I enter for your premium contains 3800 vines of from one to fifteen years' planting; 2500 of them are Concords, 2000 of which are in bearing and have been giving me fine crops for a number of years. Last year I harvested ten and a half tons of fine grapes from the 2000 vines.

My vineyard is situated on the south-east side of what is called "Pearl Hill," and is several hundred feet above any standing water, which I consider one of the most important points for a good vineyard. The soil is a good loam with what we call a hard

pan bottom. I have vines set at different distances apart and have trimmed in different ways and do not think that success in grape growing depends on any one way of trimming, but rather on the location and the soil; but a man had best take one of the different ways and follow it.

Then, to produce the finest fruit, the vine-dresser must be in love with his vines, and watch them as a mother watches the growth of her child, looking after each one, and knowing the fruiting capacity of each vine. A mother might as well ask a sick child to get a hard lesson as a vine-dresser expect a feeble vine to bring fine table fruit. And yet it is being done every year; and the cry goes out: "Why don't my vines do better?"

The question is often asked me, "How do you manure your vines?" and I have always tried to answer it, but should this question be asked me today I should say, "Study your vines and try the effect of different manures; for this is one of the corner-stones of success." Another is the maintenance of equal proportion between the top and the root, and he who is fortunate enough to maintain it, other things being favorable, will be rewarded with good grapes.

My experience for the past year has convinced me that I can grow the largest bunches on cow manure; but that muriate of potash and ground bone will produce the most sugar of anything I have ever used, and hasten the ripening from three to five days. I commenced by using four parts of bone to one of muriate of potash; but I have gradually worked in more potash, and for my land I think that is the main thing needed for the vine, but just how often and what quantity to apply is the study.

Most of my vines are set eight by six feet; and they run on a trellis made by placing chestnut posts once in twelve feet and stretching four lengths of No. 15 galvanized wire. The first wire is twenty inches from the ground; then there is a distance of fourteen inches, then thirteen inches, then fourteen inches. The wire can be fastened to the posts by staples, or by an eight-penny wrought iron nail, or two six-penny nails driven into the posts so as to cross each other near their heads. Braces can be put in to support the end posts. The vines alternate, running first on the lower and then on the third wire — the young shoots of each alternate vine to be tied up to the second and fourth wires respectively; and the first two strong shoots at the base of the vine to

be grown six feet in length and then ripened for wood to fruit the next year. By this method I have from ten to twelve feet of old wood and I intend to carry one pound of fruit for every foot of old wood.

The young shoots must be pinched when they attain the length wanted; with me it is from seven to eight leaves, and when the shoot strengthens enough it is tied as already said to the wire above. Then as the laterals start they are kept pinched in to one leaf; this sends the sap into the first leaves that started and increases their size; and this is what is wanted, as it is the first large leaves that I mainly rely on to ripen my crop.

I use the Acme harrow and hand-hoe enough to keep the weeds down; requiring more time some years than others. The exact cost per acre I cannot give, as it is carried on in connection with my other work; but as nearly as I can estimate the cost of growing an acre of grapes with me is not far from $190. Then there is quite an expense for repairs of posts, wires, baskets, etc., etc., which cannot be less than $50 a year.

Last year fertilizers were applied to part of the vineyard. This year there has been nothing of any kind applied.

Respectfully submitted by

G. B. ANDREWS.

Pearl Hill Farm.

STATEMENT OF ARTHUR J. BIGELOW.

MARLBORO', August 9, 1886.

John G. Barker, Chairman of the Committee on Gardens, Massachusetts Horticultural Society:—

DEAR SIR:

In compliance with your request for the manner of cultivating my vineyard, I offer the following:

The vineyard occupies about an acre and a half of land having a southerly exposure, with an inclination of about fifteen degrees. The soil is loam with a great number of cobble stones, and a hard, gravelly subsoil. It stands drought remarkably well. The ground slopes so much that in some places planks set on edge and supported by stakes are used to prevent too much washing of the soil.

I have 700 Concord grape vines, planted in 1869, the vines being then two years old. I gathered the first crop of fruit three years after planting, and have harvested about three tons annually since.

Every vine has a separate trellis of its own. They are planted at intervals of eight by ten feet apart. The vineyard for the last six years has been manured with half a ton of Bay State Superphosphate annually.

The labor of hoeing and summer pruning requires about twenty days' work. The annual fall pruning is done in November, about a week being required for the job.

I have fifty Moore's Early vines, set seven years ago, and have harvested a crop for the last four years. The fruit, taking one year with another, is ripe for market the 10th of September. The present season I marketed 250 pounds of clusters which on an average weighed ten ounces each, but there were some that weighed a pound and upwards. My opinion of the Moore's Early is very favorable, and I intend to plant more of it as soon as I can, although the vines seem not so prolific as the Concord; for, considering the earliness of the fruit, with its fine carrying qualities, and the vigor and hardiness of the vine, I think it a very valuable variety.

I also have a few vines of the Delaware, Brighton, Clinton, Isabella, and Worden. I do not think them profitable market varieties, although excellent for family use. I have also a few vines of the Hartford and Niagara; those of the latter sort have not come into bearing yet, and consequently I do not know what they will prove. The Hartfords, from their extreme earliness, always sell well, but should be picked as soon as ripe, for their staying quality is very poor.

The peaches of which you speak were grown on trees set nine years ago. The fourth year after planting, from an orchard of 350 trees I marketed 125 bushels; the sixth year after planting, 300 bushels; but, with the exception of this season when we had 20 bushels, I have had no peaches since. With the cold winters to which we are liable I consider the peach crop very uncertain in this part of the country. I think the chances of success are better where the trees are well headed in, removing one-half the new growth of wood in October. No other crop should be allowed to grow in the orchard. I think peaches are less liable to the yellows

on good strong land, but I notice some cases of it there. It is a waste of time and money to try to grow peaches in a frosty location.

I should be pleased to answer any other questions.

Yours,

ARTHUR J. BIGELOW.

In regard to certain points on which more particular information was desired, Mr. Bigelow wrote as follows:

DEAR SIR:

Your favor containing inquiries concerning trellises and training of vines is received, and in reply I would make the following statements:

First, the trellises are formed of two chestnut posts, set two feet in the ground and five and a half feet above; the distance between the posts at the ground is four and a half feet. The tops are joined by a chestnut strip four feet long, two inches wide, and one inch thick. Beneath this there are four lengths of No. 16 wire, the lowest twenty-six inches from the ground, and those above this a foot apart; the vines being set eight feet apart in rows, giving three feet between each trellis and the next one. The posts for the trellises are about four inches in diameter; the wires are fastened to them by staples.

Trellises made in this way with well seasoned posts will last on my soil from eight to ten years, before the posts rot in the ground. If the ends were charred, or any other preventive of decay was used, I do not doubt that they would last much longer. I prefer the above described trellises on account of the facility with which the general cultivation, the pruning, and the harvesting can be conducted. Although the cost of these trellises may be a trifle more than those commonly in use, I think the greater ease with which the vines can be managed will fully compensate for the extra cost, and feel assured that one who has once used this method will prefer it to any other.

Second, training and pruning is managed as follows:

During the spring and summer, each cane reserved for fruiting is allowed to grow until it reaches its ninth bud — then its end is pinched off; which causes the extra growth to go to laterals, and these are allowed to reach three buds in length. The cane is

trained to the wires and tied with tarred rope into nearly the form it will occupy the succeeding year.

At each fall pruning all that year's growth, with the exception of the next year's fruiting cane and two buds left for the following year's fruiting canes, is removed, two buds being left in case an accident should befall one of them. The cane is now trained to the wires in the form it will have while bearing fruit, the end being made fast to the third or fourth wire, according to shape of the vine, by a piece of No. 16 annealed wire four inches in length. This piece of wire will perform the same office for several years. We prefer to have the cane go over the fourth wire; then to be turned downward, and fastened to the third.

We have noticed when the cane has been left straight or nearly so that the sap rushes to the end, causing the buds there to break first, the intermediate ones breaking later and producing weaker shoots.

If our observations are correct, the more the cane is bent the more uniformly the buds break; that has been our experience at least; consequently we train our fruiting canes into the form of a hoop, and are satisfied that our fruit ripens earlier and more evenly by this method.

We leave two joints on the laterals and notice that the fruit is as good from the second as the first, but can give no reason why it should be so. This method of pruning works well with the Concords and Moore's Early; but we can not say how it would be with other varieties, as we make specialties of no others.

Both these gentlemen received your Committee in the most hospitable manner. Mr. Andrews has a delightful location for his vineyard; and is doing all he can to make the culture of the grape a success, and he had promise of a fine crop of fruit.

The excellent success attained by Mr. Bigelow is only additional evidence of what perseverance can do in utilizing what was once an unprofitable piece of ground. His principal crop, the Concord, was to be ranked among the best we ever saw; the foliage was very large, clean, and handsome, and the bunches of fruit were superb. We think that the vines being placed singly (each one having a separate trellis to itself), and also not being planted as close as usual, and the excellent care bestowed upon them, keeping the foliage in the healthiest possible condition, all

contributed largely to produce so fine a crop of fruit. The individual bunches, taken all through the vineyard, were the best we have seen. It is not often that John B. Moore is beaten, but here we found the Moore's Early in the best state of cultivation that we have thus far had the pleasure to witness, and bearing the largest bunches and the best ripened fruit that we have ever seen and tasted; at this date (September 9) it was fully ripe. Your Committee, with other invited guests fully competent to judge of the merits of any fruit, will bear cheerful witness to the great value of this grape as an early fruit, and that it continues to merit all that has been said in praise of it.

The value of the Grape for general culture is acknowledged by all cultivators. So improved by hybridization have been the best varieties of this useful fruit that the interest in grape culture has never been so great as at the present time. What fruit is so universally enjoyed by everybody as the grape? And now that it is so largely grown, and sold at such moderate prices — when three pounds can be purchased for twenty-five cents—who is there even among the poorest that cannot get a taste of them. And whether borne on the single vine grown over the trellis in your back yard, on the few vines against the board fence, or on stakes, or in larger quantities by the marketman for commercial purposes — no fruit is more welcome than the grape; and who of us is not glad that we can buy so cheap that the grape can always accompany the pear in our dessert?

In an article in the "North American Review" of April, 1865, on grape culture, we read that "no branch of horticulture has attracted greater attention among us of late years than vine growing; and the culture of grapes, both for wine making and for sale in the market, is becoming, even in New England, an important branch of popular labor." These remarks are followed by a very elaborate discussion of the vine and its culture, varieties, and hybridization, and the profits of the business; in which it is claimed that the cultivation of the vine yields larger and more certain returns than that of anything else that can be grown in New England, tobacco alone excepted. It is further claimed that "eight tons of Concord grapes have been raised on an acre in Massachusetts, and that six tons is an average crop from vines five or six years old; and Mr. Bull says that an acre of vines four years old will give the cultivator

fourteen thousand pounds." Wine making is then discussed, and the writer says "we hardly dare to look forward to the time when the vine shall cover the bleak and barren hills of New England — but we do see close at hand the day when broad vineyards will be planted to supply with their luscious fruit the markets of our cities and great towns, and when rows of well chosen and well trained vines will be as common an appendage to every decent garden as a line of currant bushes is now."

The barren hills are not all covered, but a good many are, and we think that the writer of the article from which we have quoted (the late lamented John M. Merrick, Jr.) would have been surprised if he could have been spared to witness what your Committee have seen in the past few years. We think he would be convinced that, in view of the remarkable progress already made, we are surely in a fair way to cover them. Many an unproductive hill, if not made to blossom as the rose, has been made to yield luscious fruit; and where no return ever came, now a handsome profit is the yearly result.

We believe that the culture of the grape is yet in its infancy, and — to use the words of the writer already referred to — we wish we could say, in persuasive accents, to every one who owns a rod of land, "Plant a good vine, tend it and care for it, and you will have your reward."

The Committee have awarded the following prizes:

To Arthur J. Bigelow, Marlboro, the first prize for the best vineyard, $30.00.

To George B. Andrews, Fitchburg, the prize for the second best vineyard, $20.00.

All of which is respectfully submitted.

JOHN G. BARKER,
E. W. WOOD,
JOS. H. WOODFORD,
C. N. BRACKETT,
BENJ. G. SMITH,
HENRY W. WILSON,
CHARLES W. ROSS.
} *Committee.*

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION,

FOR THE YEAR 1886.

In submitting this report to the Society, we are gratified to note that the publications of the year are of increased size and interest, and well calculated to promote the diffusion of horticultural knowledge; and we concur with entire unanimity in the conclusion that this year has been one of relative superiority and increased success in this department of work. Through the untiring labors of the Secretary and his assistant, the TRANSACTIONS for the year have appeared in print and been placed in the hands of members and also forwarded to other societies of kindred interests, with commendable promptness.

During the winter months the meetings for discussion have been well attended, and the weekly bulletins of the Society, containing abstracts of the essays and discussions, have been extensively circulated and read.

The series of essays has embraced a wide range of subjects, not only adapted to interest and instruct the members of the Society, but tending to build up and elevate the happiness of domestic and rural life.

The discussions following the essays, perhaps, have not fully met the expectations of your Committee, but this may possibly be attributed to the fact that the essays were elaborate papers, treating of large subjects, and requiring more thought and consideration than the limited time would permit. But it may be fairly stated that the meetings constituted a series of well defined steps in progress, and when considered as a whole we may feel well encouraged with the manifest result.

The Committee desire to express their most cordial thanks and esteem to the lady and the gentlemen who have so kindly and generously contributed, by their essays and discussions, to the success and progress of the Society during the year now closing.

The Committee having been again charged with the duty of awarding the prizes offered for the best reports of the committees to award prizes for horticultural products, recommend the following awards:

The First Prize of $10 to E. W. Wood, for the Report of the Committee on Fruits.

The Second Prize of $8, to Charles N. Brackett, for the Report of the Committee on Vegetables.

The Third Prize of $6, to Joseph H. Woodford, for the Report of the Committee on Plants and Flowers.

O. B. Hadwen,
Francis H. Appleton,
William H. Hunt,
} *Committee.*

REPORT

OF THE

COMMITTEE ON THE LIBRARY,

FOR THE YEAR 1886.

The affairs of our Library run so much in the same channels from year to year that the Report of this Committee can have little of novelty. We report this year, as usual, that the income of the Stickney Fund has been expended in accordance with the conditions imposed by the giver and that the Society's appropriation has gone for periodicals and binding. The amount granted for continuing the Catalogue of Plates will have been expended by the end of the present month; the progress of the work has been as great as could be expected for the sum allowed.

In accordance with the practice which has prevailed for several years, our first care has been to procure as many works upon practical details of culture as possible, and, next, to buy the best illustrated works to be had, preferring always colored plates when such could be had, for a glance at a good figure is of more value to one who wishes to know the appearance of a plant, than the most careful description, which, to be of value, must be in technical language. Among the most noteworthy of this class of books, not only for the excellence of the plates but for the great interest of the subject, are the two serials devoted to orchids, the Orchid Album and Lindenia; which have been regularly received throughout the year.

Mr. Maw's monograph of the genus Crocus, and Antoine's serial work on the Bromeliaceæ, though dealing with subjects of no commercial importance, will be welcomed by many; as will also be the many smaller manuals upon special subjects, such as those upon cacti, primroses, clematis, carnations and fuschias.

The number of pamphlets received this year by purchase and otherwise has been very large, and includes many of great interest and value; those on forestry have been surprisingly numerous.

The Committee would particularly mention, among other donations to the Library, the bequest of Mrs. Ellen A. Cooke (widow of Henry C. Cooke, who was a member of the Society) of her library of horticultural works. Besides those mentioned in the list of library accessions, the bequest comprised a large number of duplicates of books already in the library, which it is not necessary to enumerate.

In the first part of the year the condition of the collection of ferns presented by Mr. Davenport was discussed and a report has been drawn up in reference to it by Mr. Humphrey, which, having been adopted by this Committee, is here given:—

To the President and Members of the Massachusetts Horticultural Society.

GENTLEMEN:

The Library Committee desires to call your attention to the valuable herbarium of North American Ferns, the gift of Mr. George E. Davenport to the Society.

When presented in 1875 it contained one hundred and sixteen species and many varieties, there being credited as growing north of Mexico at that time one hundred and thirty-one species and twenty-five varieties.

At the present time there are known in those limits thirty-two genera comprising one hundred and sixty-five species and twenty-four varieties, recognizing as varieties only such forms as appear to be permanent. The herbarium is now complete, as it contains specimens of all the ferns included in the above-mentioned genera, species, and varieties; embracing seven hundred sheets and about twenty-five hundred specimens, each species and variety being represented by numerous fronds, showing its various stages of growth as well as its range of distribution.

The herbarium is especially rich in Botrychia, that genus being represented by nearly four hundred specimens in an innumerable variety of forms.

The Asplenia, Aspidia, and Cheilanthes are also extensively represented; the last, especially, showing probably the largest collection of some species to be found in any herbarium, including

Cheilanthes Parishii, a fern which has never been collected but once and of which only three or four specimens are known to exist.

The market value of this collection may be safely estimated at three hundred and fifty dollars, while the value of the donor's time, expended in arranging and adding to it during the last ten years, is inestimable. His work has been entirely a labor of love, without thought of compensation, and has produced an herbarium superior in its specialty to any other in this country, as many noted botanists who have examined it have testified.

The collection also includes numerous and valuable autograph letters from the prominent botanists of the country, including Professor Asa Gray, Professor Daniel C. Eaton, Dr. A. W. Chapman and others, upon matters of especial importance to botanists. Mr. Davenport has printed, at his own expense, a catalogue of the herbarium, which is of great assistance in the examination of specimens.

The Committee, therefore, in view of the foregoing facts, and believing the herbarium to be of great value to botanists, students, and the public, and to reflect much credit upon the Society which possesses it, respectfully and earnestly requests that the Silver Medal of the Society be conferred upon Mr. George E. Davenport in recognition of the service he has thus rendered.

For the Committee,

W. E. ENDICOTT, *Chairman.*

LIBRARY ACCESSIONS.

Books Purchased.

Millspaugh, Charles F., M. D. American Medicinal Plants; an illustrated and descriptive guide to the American Plants used as Homœopathic Remedies. Fascicles 1–5. 4to. 150 colored plates. New York and Philadelphia: 1884–1886.

Lloyd, J. W. and G. C. Drugs and Medicines of North America. Vol. 1 and Parts 1 and 2 of Vol. 2. Royal 8vo. 34 plates and 129 wood-cuts. Cincinnati: 1884.

Oyster, Dr. J. H. Catalogue of Phænogamous and Vascular Cryptogamous Plants of North America (exclusive of Mexico). 8vo. pamphlet. Paola, Kansas: 1885.

Arthur, J. C. Contributions to the Flora of Iowa. A Catalogue of the Phænogamous Plants. Nos. 1–6. 6 pamphlets, 8vo. Various dates and imprints. [From the Proceedings of the Davenport Academy of Natural Sciences.]

Coulter, John M., Ph. D., etc. Manual of the Botany (Phænogamia and Pteridophyta) of the Rocky Mountain Region, from New Mexico to the British Boundary. 8vo. New York and Chicago: 1885.

Hemsley, W. B. Biologia Centrali-Americana. Parts 20 and 21. Decem ber 1885, and February 1886, in continuation. 4to. Plates 101–109.

Miquel, F. A. Guil. Stirpes Surinamenses Selectæ. 4to. 65 plates. Leyden: 1850.

Martius, C. F. P. de. Flora Brasiliensis. Fasciculi 94, 95, and 96, in continuation. Folio. Plates.

Vos, André de. Flore Complète de la Belgique. 12mo. Mons: 1885.

Reichenbach, H. et H. G. (fils). Icones Floræ Germanicæ et Helveticæ. Tom. 22, Decas 17–22, in continuation. 4to. 60 colored plates. Leipsic.

Schlechtendahl, Dr. D. F. L. von, Dr. L. E. Langethal, und Dr. Ernst Schenk. Flora von Deutschland. Lieferungen 128–191, in continuation. Small 8vo. Many colored plates. Gera Untermhaus: 1886.

Willkomm, Maurice. Illustrationes Floræ Hispaniæ insularumque Balearium. Livraison 11, in continuation. 4to. 9 colored plates. Stuttgart 1886.

Allione, Carlo. Flora Pedemontana, sive enumeratio methodica stirpium indigenarum Pedemontii. 3 vols. Folio. 92 plates. Turin: 1785.

Cesati, Passerini, è Gibelli. Compendio della Flora Italiana. Fascicoli 33 è 34; tavole 93–100, completing the work. Large 8vo. Milan, etc.: 1886.

Barbey, William. Floræ Sardoæ Compendium: Catalogue raisonné des végétaux observés dans l'ile de Sardoigne. Avec supplement par MM. P. Ascherson et E. Levier. 4to. 7 plates and a photograph of Prof. Giuseppe Giacinto Moris. Lausanne: 1884.

Desfontaines, Renato. Flora Atlantica, sive historia plantarum quæ in Atlante, agro Tunetano et Algeriensi crescunt. Text, 2 vols. in 1. 261 plates, 2 vols. in 1. 4to. Paris: anno VIII [1794].

Regel, E. Descriptiones Plantarum Novarum Rariorumque a Cl. Olga Fedstchenko in Turkestania nec non in Kokania lectarum. Tom. 3. Fasc. 18. 4to. Moscow and Berlin: 1882.

Oliver, Daniel, F. R. S., F. L. S., etc. First book of Indian Botany. New Edition. 16mo. 242 wood-cuts. London: 1881.

Hooker, Sir J. D., C. B., K. C. S. I., etc. The Flora of British India. Vol. 4, in continuation. Asclepiadeæ to Amarantaceæ. 8vo. London: 1885.

Piddington, H. An English Index to the Plants of India. 8vo. Calcutta: 1832.

Dalzell, Nicholas A., and Alexander Gibson, F. L. S. The Bombay Flora; indigenous, or introduced and naturalized. 8vo. Bombay: 1861.

Miquel, F. A. W. Flora Indiæ Batavæ. 3 vols. in 4. 8vo. 41 plates. Amsterdam, Utrecht, and Leipsic: 1855–1859.

Burman, Johannes, Professor, etc. Thesaurus Zeylanicus, exhibens plantas in insula Zeylana nascentes; inter quas plurimæ novæ species et genera inveniuntur. 2 vols. 4to. Vol. 1, text. Vol. 2, 110 plates. Amsterdam: 1737.

Brown, Robert. Prodromus Floræ Novæ Hollandiæ et Insulæ Van-Diemen, etc. Vol. 1. 8vo. London: 1810. Folio atlas, 15 plates, by Ferdinand Bauer. London: 1813.

Sinclair, Mrs. Francis, Jr. Indigenous Flowers of the Hawaiian Islands. Folio. 44 plates. London: 1885.

Gaudichaud-Beaupré, M. Charles. Botanique du Voyage autour du Monde, fait par ordre du Roi, sur les corvettes de S. M. l'Uranie et la Physicienne, pendant les années 1817, 1818, 1819, et 1820; par M. Louis de Freycinet. 4to., with folio atlas of 120 plates. Paris: 1826.

Klotzsch, Dr. Fr., und Dr. Aug. Garcke. Die Botanischen Ergebnisse der Reise seiner Konigl. Hoheit des Prinzen Waldemar von Preussen, in den Jahren 1845 und 1846. Folio. 100 plates. Berlin: 1862.

Thompson, Sir C. Wyville, Knt., F. R. S., etc. Report on the Scientific Results of the Voyage of H. M. S. Challenger, during the years 1873–76. Botany. Vol. 1. Large 4to. 65 plates. London, Edinburgh, and Dublin: 1885.

Johnston, H. W., F. Z. S., F. R. G. S. The Kilima-njaro Expedition. 8vo. 6 maps and over 80 illustrations by the Author. London: 1886.

Lavallée, Alphonse. Les Clematites à grandes fleurs. Description et iconographie des espéces cultivées dans l'arboretum de Segrez. Folio. 24 plates. Paris: 1883.

Kuntz, Dr. Otto. Monographie der Gattung Clematis. [Separatabzug aus den Verhandlungen des Botanischen Vereins der Provinz Brandenburg. XXVI.] 8vo. pamphlet. Berlin: 1885.

Weddell, M. H-A., M. D. Histoire Naturelle des Quinquinas. Large folio. 34 plates. Paris: 1849.

Howard, John Eliot, F. R. S., etc. Illustrations of the Nueva Quinologia of Pavon. Large folio. 27 colored plates. London: 1862.

Howard, John Elliot, F. R. S., etc. The Quinology of the East Indian Plantations. Folio. 18 plates, mostly colored, and two photographs. London: 1869–1876.

Triana, J., Botaniste de la Commission Chorographique des Etats-Unis de la Colombie (Nouvelle Grenade), etc. Nouvelles Études sur les Quinquinas, accompagnées de fac-simile des dessins de la Quinologie de Mutis. Folio. 33 plates. Paris: 1870.

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The Nurseryman's Directory for the United States, in 1875. 8vo. Galena, Illinois. Francis Parkman.

Virginia, Handbook of. 5th edition. By the Commissioner of Agriculture. 8vo. pamphlet, with map. Richmond, 1886. Randolph Harrison, Commissioner.

Smithsonian Institution. Annual Report of the Board of Regents for the year 1884. Part 2, being the Report of the United States National Museum. 2 vols., 8vo. Washington: 1885. Also Price List of Publications. 8vo. pamphlet. Washington: 1885. The Smithsonian Institution.

Powell, J. W., Director. Third Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, 1881–82. Royal 8vo., with many colored and other plates and wood-cuts. Washington: 1884. The Smithsonian Institution.

Ottawa Field Naturalists' Club. Transactions. Vol. 2, No. 2. 8vo. pamphlet. Plate. Ottawa: 1884. F. R. Latchford, Librarian.

Boston Society of Natural History. Proceedings. Vol. 23, Part 2. March, 1884–February, 1886. 8vo. pamphlet. Edward Burgess, Secretary.

New York Microscopical Society. Journal for 1886. N. L. Britton, Ph. D., Editor. 10 numbers, 8vo. 6 plates. New York.

Trenton Natural History Society. Journal of January, 1886. Vol. 1, No. 6. 8vo. pamphlet. The Smithsonian Institution.

Hooker, Sir Joseph Dalton. Address delivered at the Anniversary meeting of the Royal Society, November 20, 1878. 8vo. pamphlet. London: 1878. Charles S. Sargent.

United States War Department. Annual Report of the Chief Signal Officer to the Secretary of War, for the year 1884. 8vo. Charts. Washington: 1884. The Secretary of War.

Boston Public Library. Thirty-fourth Annual Report of the Trustees, City Document No. 33, 1886; for the eight months ending December 31, 1885. 8vo. pamphlet. Hon. Mellen Chamberlain, Librarian.

Lawrence Free Public Library. Fourteenth Annual Report of the Trustees, and report of the Librarian, for 1885. 8vo. pamphlet. Lawrence, Mass.: 1886. Frederick H. Hedge, Jr., Librarian.

Astor Library. Thirty-seventh Annual Report of the Trustees, for the year 1885. 8vo. pamphlet. New York: 1886.

Library Company of Philadelphia. Bulletin for January and July, 1886. 2 pamphlets, 8vo.

Friedlander, R. & Sohn. Bibliotheca Historico-Naturalis et Mathematica. Lager-Catalog. 8vo. Portrait of Linnæus. Berlin: 1886. The Publishers.

Massachusetts Institute of Technology. Twenty-first Annual Catalogue, for the year 1885–86. 8vo. pamphlet, 2 plates. Boston: 1885. The Institute.

Bowdoin College. Eighty-fifth Annual Catalogue, for the year 1886–87. 8vo. pamphlet. Brunswick, Me.: 1886. William DeWitt Hyde, President.

Drury College. Thirteenth Annual Catalogue, for the year 1885–1886. 8vo. pamphlet. Saint Louis, Mo., 1886. Rev. N. J. Morrison, D. D., President.

United States Bureau of Education. Report for 1883–84. 8vo. Washington, 1885. Special Report on Educational Exhibits and Conventions at the New Orleans Exposition of 1884–5. In three parts. 8vo. Washington: 1886. Circulars of Information, Nos. 3–4, 5. 3 pamphlets, 8vo. Washington: 1885, 1886. The Commissioner.

New England Historic-Genealogical Society. Proceedings at the annual meeting, January 6, 1886. 8vo. pamphlet. Boston: 1886. The Society.

Maine Historical and Genealogical Recorder. Vol. 3, No. 2. Square 8vo. Portrait and genealogical sketch of General H. A. S. Dearborn. Portland, Me.: 1886. S. M. Watson, Publisher.

Gilbert, John, Biographical sketch of. [From the History of Hillsborough County, New Hampshire.] 4to. pamphlet. Philadelphia: 1885. Elizabeth G. Frost.

Wisconsin State Historical Society. Thirty-second Annual Report. 8vo. pamphlet. n. d. [1886.] Daniel S. Durrie, Librarian.

Bureau of Statistics of Labor. Proceedings of the Third Annual Convention of Chiefs and Commissioners, held at Boston, June and July, 1885. With papers read before the Convention. 8vo. pamphlet. Boston: 1885. Edward Atkinson.

United States Consular Reports, Nos. 58–68½. On the Commerce and Manufactures in the Consular Districts; on the Leather and Shoe Industries, etc. 12 pamphlets, 8vo. Washington: 1885–86.

Periodicals Purchased.

English. — Gardeners' Chronicle.
Gardeners' Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Gardening Illustrated.
Horticultural Times and Covent Garden Gazette.
Curtis's Botanical Magazine.
Journal of Botany.
Forestry.

French. — Revue Horticole.
Revue des Eaux et Forêts.
Journal des Roses.

Belgian. — Illustration Horticole.
Revue de l'Horticulture, Belge et Étrangère.

German. — Botanische Zeitung.
Gartenflora.

American.—Country Gentleman.
American Naturalist.

Periodicals Received in Exchange.

Gardeners' Monthly.
Canadian Horticulturist.
Ladies' Floral Cabinet.
American Garden.
Popular Gardening.
Vick's Illustrated Monthly Magazine.
Horticultural Art Journal.
American Horticulturist.
American Florist.
Orchard and Garden.
Fruit Recorder.
Green's Fruit Grower.
Seed Time and Harvest.
Botanical Gazette.
Journal of Mycology.
West American Scientist.
Maine Farmer.
The Home Farm.
Mirror and Farmer.
New England Farmer.
Massachusetts Ploughman.

American Cultivator.
New England Homestead.
Our Country Home.
American Agriculturist.
Rural New Yorker.
American Rural Home.
The Farm Journal.
Maryland Farmer.
Florida Dispatch.
Prairie Farmer.
The Industrialist.
Pacific Rural.
Boston Daily Advertiser.
Boston Morning Journal.
Boston Post.
Boston Daily Globe.
Boston Evening Transcript.
Boston Daily Evening Traveller.
New York Weekly World.
The Cottage Hearth.

REPORT

OF THE

SECRETARY AND LIBRARIAN,

FOR THE YEAR 1886.

The duties of these offices, with all their leading attendant circumstances, are each year so similar to those of the preceding that it is difficult to avoid a great degree of sameness in the annual reports. Whatever difference exists is in the details rather than in the prominent features; therefore a certain degree of monotony in the reports is not to be escaped except by going more fully into details than time will allow, or than the patience of the Society would endure. Moreover an unusually full report was made last year, which to a great extent will obviate the necessity of elaboration at the present time.

In the office of Secretary, the keeping of various records, making reports of meetings and exhibitions, preparing matter for the press and attending to the printing, answering inquiries personally and by mail, and a round of similar duties have fully occupied all the time that could be devoted to them. It will be noticed that the publications have, during the last few years, gradually increased in bulk: and if we may credit the favorable notices which have appeared in horticultural journals, both in this country and in Europe, a still more gratifying increase may be observed in the interest with which they are regarded.

The greatly increased success of the larger exhibitions of the Society within the last few years has not been attained without a corresponding addition to the labors of the Secretary, both preliminary to, and consequent on, the exhibitions.

In regard to the Library, I would say that whatever time can be gained by diligence and method elsewhere, finds full employment here. The work which may be done to good purpose upon a

library — even a small one — is limited only by the zeal and ability of the workers. Our own library was never growing so rapidly as now. The amount of money expended for books, magazines, etc., being the same annually, no great variation can be expected from year to year in the number added by purchase. It is in the number received by donation and exchange that the greatest variation may be looked for, and here we find a large increase. The year 1886 not being quite closed, the exact number received cannot be given, but in 1885 pamphlet publications numbering more than three hundred were added to the library — equalling more than half the aggregate acquired during the first fifty years of the Society's existence, and nearly equalling one-half the aggregate added during the six years from 1879 to 1884, inclusive.

Funds derived from the sale of certain books not suited to the library have enabled us to bind a greater number of volumes than for some years previous. Several works of much value had been held for a considerable time, awaiting the day when the binders' art should put them in a form pleasant to the sight and convenient for use. Some of these publications have required an amount of time and care in arranging for the binder which can only be appreciated by those familiar with such work. Most of the costly illustrated works, which form one of the most important features in such a library as this, are published in parts, the publication often extending over several, and sometimes many, years. Justice to such works would seem to require that when after completion they are taken in hand to be placed in permanent form, no pains should be spared to have them pass this final stage without disastrous errors of collation, and this is often a matter requiring considerable study.

In conclusion I wish to express my warmest thanks to the Committee on Publication and Discussion, and to the Committee on the Library, for the heartiness with which I have been supported and for the kind appreciation accorded to my endeavors faithfully to perform the duties of the two departments which, under the Constitution and By-Laws of the Society, are subject to the general direction of these Committees.

ROBERT MANNING,

Secretary and Librarian.

TREASURER'S REPORT,

FOR THE YEAR 1886.

RECEIPTS.

Cash on hand, as per last Report,		$4,273 91
Rent of Halls,		10,658 30
Rent of Stores,		12,892 02
Admissions and Assessments,		1,078 00
Sale of History,		44 50
Mount Auburn Cemetery,		3,462 09
Annual Exhibitions,	$3,647 10	
Less Expenses,	1,317 94	2,329 16
State Bounty,		600 00
Sinking Fund, Sale of Bonds,	$23,621 04	
" " Paid for Bonds,	5,028 06	18,592 98
		$53,930 96

EXPENDITURES.

Labor,	$1,337 59	
Salaries,	2,875 00	
Incidentals,	204 83	
Interest Paid,	$2,550 00	
" Received,	871 97	1,678 03
Heating and Water, less paid by Tenants,		443 76
Taxes,	2,286 00	
Repairs on Building,	269 48	
Lighting,	1,199 82	
Furniture and Fixtures,	163 63	
Prizes,	4,562 28	
Committee of Arrangements,	300 00	
Garden Committee,	60 41	
Committee on Publication and Discussion,	128 00	
Stationery, Postage, and Printing,	1,272 80	
Stickney Fund,	720 03	
Carried forward,	$17,501 66	

Brought forward,	$17,501 66	
Library,	300 00	
Card Catalogue,	100 00	
Mortgage Debt, paid on account,	30,000 00	
Legal Services,	69 78	
Portraits,	443 00	
Cash on hand to new account for 1887,	5,516 52	
		$58,930 96

ASSETS.

Real Estate, Furniture, and Exhibition Ware,		$256,585 56
Library, last year,	$24,646 12	
Added this year,	1,000 00	
		25,646 12
H. H. Hunnewell Rhododendron Fund: 2 Bonds C. B. and Q. R. R., $1,000, $500,		1,500 00
Benjamin B. Davis Fund: 1 Bond Illinois Grand Trunk R. R., face value $500,		583 00
Stereotype Plates and Copies of History,		255 00
Cash on hand December 31, 1886,		5,516 52
		$290,086 20

LIABILITIES.

Mortgage Debt, bearing interest at 4½ per cent per annum, due October 1, 1888,	$30,000 00	
Loan without interest, payable to Harvard College in 1899,	12,000 00	42,000 00
		$248,086 20

MEMBERS.

Number of Life Members per last report,	589
Added during the year,	15
Commuted from Annual,	3
	607
Deceased during the year or now first reported,	31
	576

Annual Members per last report,		268	
Added during the year,		12	
		280	
Deceased during the year or now first reported,	5		
Discontinued,	16		
Commuted to Life,	3		
	—	24	
		—	256
Total Membership,			832

INCOME FROM MEMBERSHIP.

16 Life Members (including one deferred from 1885),	$480 00	
12 Annual Members,	120 00	
176 Assessments,	418 00	
3 Commuted,	60 00	
		$1,078 00

The Finance Committee having audited the accounts of the undersigned made and have subscribed to, on a book kept for that purpose, the following report:

The Massachusetts Horticultural Society

In account with GEORGE W. FOWLE, *Treasurer.*

Credit:—

By balance in treasury, December 31, 1885,	$4,273 91
" total income, as per receipt book,	49,657 05
	$53,930 96

Debit:—

To cash paid out, per cash book,	$48,414 44
" balance on hand to new account,	5,516 52
	$53,930 96

BOSTON, March 31, 1886. We have examined the above account and find it correct, and the balance of cash on hand fifty-five hundred and sixteen dollars and fifty-two cents.

H. H. HUNNEWELL,
F. L. AMES,
H. P. WALCOTT,
} *Finance Committee.*

The Mortgage Debt has been reduced from $60,000 to $30,000 from the sale of Sinking Fund Bonds and the surplus in the Treasury.

The receipts from the Halls during the past year have shown an increase.

GEORGE W. FOWLE,

Treasurer.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31, 1886.

To cost of filling up and improving land at Mt. Auburn for the year ending December 31, 1886; the Massachusetts Horticultural Society being charged with their proportion of the same:		By Sales in January,	$1,275 00
Glen Avenue,	$1,570 12	" " " February,	270 00
Linden Path,	465 94	" " " March,	846 00
Birch Avenue to Eagle and Cherry Avenues,	1,053 57	" " " April,	1,617 00
	$3,089 63	" " " May,	1,782 50
		" " " June,	3,889 13
		" " " July,	3,041 00
		" " " August,	170 00
		" " " September,	1,222 50
		" " " October,	1,745 38
		" " " November,	565 50
		" " " December,	1,085 00
			$17,509 01
		Net amount received from Receiving Tomb,	916 00
			$18,425 01
		Less graves repurchased,	87 00
			$18,338 01
		Deduct for Annual Expenses,	1,400 00
			$16,938 01
One-quarter of $3,089.63 is	$772 41		
Balance due Massachusetts Horticultural Society,	3,462 09		
	$4,234 50	Mass. Horticultural Society's one-fourth part of $16,938 01 is	$4,234 50

E. & O. E.

H. B. MACKINTOSH, *Treasurer.*

December 31, 1886.

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, *Dr.*

For one-fourth part of the following expenditures for grading new lands for sale during the year 1886:

Glen Avenue.

418¼ days, men,	$941 06	
167¾ " man and horse,	629 06	
		$1,570 12

Linden Path.

132½ days, men,	$298 13	
44¾ " man and horse,	167 81	
		$465 94

Birch Avenue to Eagle and Cherry Avenues.

174½ days, men,	$392 63	
176¼ " man and horse,	660 94	
		$1,053 57
		$3,089 68
One-fourth part of $3,089.68 is		$772 41

J. W. LOVERING,
Superintendent.

MOUNT AUBURN, Dec. 31, 1886.

I certify the foregoing to be a true copy of improvements for the year 1886, rendered by the Superintendent.

H. B. MACKINTOSH,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1887.

President.

HENRY P. WALCOTT, of Cambridge.

Vice-Presidents.

CHARLES H. B. BRECK, of Brighton. FREDERICK L. AMES, of North Easton.
BENJAMIN G. SMITH, of Cambridge. WILLIAM H. SPOONER, of Jamaica Plain.

Treasurer and Superintendent of the Building.

GEORGE W. FOWLE, of Boston.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees.

Executive.

THE PRESIDENT, HENRY P. WALCOTT, CHAIRMAN.
THE CHAIRMAN OF THE FINANCE COMMITTEE, H. H. HUNNEWELL; WILLIAM C. STRONG, F. L. AMES, CHARLES H. B. BRECK, HENRY WELD FULLER, CHARLES S. SARGENT, WILLIAM H. SPOONER, EDWARD L. BEARD.

* Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston

Finance.

H. HOLLIS HUNNEWELL, CHAIRMAN.

HENRY P. WALCOTT. FREDERICK L. AMES.

Publication and Discussion.

O. B. HADWEN, CHAIRMAN.

FRANCIS H. APPLETON. WILLIAM H. HUNT.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;* C. M. ATKINSON, EDWARD L. BEARD, JACKSON DAWSON.

Library.

WILLIAM E. ENDICOTT, CHAIRMAN.

THE PROFESSOR OF BOTANY AND VEGETABLE PHYSIOLOGY AND THE PROFESSOR OF ENTOMOLOGY, *EX OFFICIIS;*

J. D. W. FRENCH. NATHANIEL T. KIDDER.

FRANCIS H. APPLETON. GEORGE W. HUMPHREY.

Gardens.

JOHN G. BARKER, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, AND VEGETABLES, *EX OFFICIIS;*

CHARLES W. ROSS, BENJAMIN G. SMITH, HENRY W. WILSON.

Fruit.

E. W. WOOD, CHAIRMAN.

BENJAMIN G. SMITH.	J. W. MANNING.	WARREN FENNO.
CHARLES F. CURTIS.	O. B. HADWEN.	SAMUEL HARTWELL.

Plants and Flowers.

JOSEPH H. WOODFORD, CHAIRMAN.

F. L. HARRIS.	WARREN H. MANNING.	ARTHUR H. FEWKES.
DAVID ALLAN.	W. A. MANDA.	MICHAEL H. NORTON.

Vegetables.

CHARLES N. BRACKETT, CHAIRMAN.

WARREN HEUSTIS.	CEPHAS H. BRACKETT.	GEORGE HILL.
P. G. HANSON.	JACOB HITTINGER.	VARNUM FROST.

Committee of Arrangements.

EDWARD L. BEARD, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FRUITS, FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;*

WARREN HEUSTIS. CHARLES L. FOWLE.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is inaccurate in any particular will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus †.

Adams, Luther, Brighton.
Albro, Charles, Taunton.
Alger, R. F., Becket.
Allan, David, Mount Auburn.
Ames, Frank M., Canton.
Ames, Frederick L., North Easton.
Ames, George, Boston,
Ames, Preston Adams, South Hingham.
Amory, Charles, Boston.
Amory, Frederick, Boston.
Anderson, Alexander, West Hingham.
Andrews, Charles L., Milton.
Andrews, Frank W., Boston.
†Andros, Milton, Brookline.
Appleton, Edward, Reading.
Appleton, Francis H., Peabody.
Appleton, William S., Boston.
Atkins, Elisha, Boston.
Augur, P. M., Middlefield, Ct.
Avery, Edward, Boston.
Ayling, Isaac, M. D., Waltham.

†Bacon, George, M. D., Brookline.
Bailey, Edwin C., West Stowe, Vt.
Baker, William E., Boston.
Bancroft, John C., Boston.
Banfield, Francis L., Boston.
Barnard, James M., Malden.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
Barnes, William H., Boston.
†Barney, Levi C., Boston.
Barratt, James, Cambridgeport.
Barrett, Edwin S., Concord.
Bartlett, Edmund, Newburyport.
Bates, Amos, Hingham.
Bates, Caleb, Kingston.
†Bayley, John P., Boston.
Beal, Alexander, Dorchester.
Beckford, Daniel R., Jr., Dedham.
Bell, Joseph H., Quincy.
Bemis, Emery, Cambridge.
Berry, James, Brookline.
Bickford, Weare D., Newtonville.
Birchard, Charles, Framingham.
Black, James W., Cambridge.
Blagg, Samuel, Jamaica Plain.
Blake, Arthur W., Brookline.
Blakemore, John E., Roslindale.
Blanchard, John W., Dorchester.
Blaney, Henry, Boston.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Springfield.
Bocher, Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bond, George W., West Roxbury.
Borland, John N., M. D. New London, Ct.
Botume, John, Wyoming.
Bouvé, Thomas T., Boston.
Bowditch, Azell C., Somerville.
Bowditch, J. Ingersoll, Jamaica Plain.
Bowditch, William E., Roxbury.
Bowker, William H., West Newton.
Brackett, Cephas H., Brighton.

Brackett, Charles N., Newton.
Bradish, Levi J., Boston.
Bragg, Samuel A. B., Dorchester.
Breed, Henry A., Lynn.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
Brewer, John Reed, Boston.
Brewer, Otis, West Roxbury.
Brigham, William T., Boston.
Brimmer, Martin, Boston.
Brintnall, Benjamin, Charlestown.
Brooks, Francis, West Medford.
Brown, Alfred S., Jamaica Plain.
Brown, Charles E., Yarmouth, N. S.
Brown, Edward J., Weston.
†Brown, G. Barnard, Boston.
Brown, George Bruce, Framingham.
Brown, Jacob, Woburn.
Brownell, E. S., Essex Junction, Vt.
†Bruce, Nathaniel F., Stoneham.
Bullard, John R., Dedham.
Bullard, William S., Boston.
Burnett, Joseph, Southborough.
Burnham, Thomas O. H. P., Boston.
Burr, Fearing, Hingham.
Burr, Matthew H., Hingham.
Buswell, Edwin W., New York, N.Y.
Buswell, Frank E., New York, N. Y.
†Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Butterfield, William P., East Lexington.

Cabot, Edward C., Brookline.
Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carruth, Charles, Boston.
Carter, Miss Sabra, Wilmington.
Cartwright, George, Dedham.
Chadbourne, Marshall W., Watertown.
Chamberlain, Chauncey W., Boston.
Chapin, Nathaniel G., Brookline.
Chapman, Edward, South Framingham.
Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Boston.
Chase, Hezekiah S., Boston.
Chase, William M., Baltimore, Md.
Cheney, Benjamin P., Boston.
Child, Francis J., Cambridge.
Child, William C., Medford.
Childs, Francis, Charlestown.
Childs, Nathaniel R., Boston.
Choate, Charles F., Cambridge.
Claflin, Henry, Newton.
Claflin, William, Newton.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, Orus, Boston.
Clark, W. L., Neponset.
Clarke, Miss Cora H., Jamaica Plain.
Clay, Henry, Dorchester.
Cleary, Lawrence, West Roxbury.
Clement, Asa, Dracut.
Cleveland, Ira, Dedham.
Cobb, Albert A., Brookline.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, Lincoln.
Coffin, G. Winthrop, West Roxbury.
Coffin, William E., Dorchester.
Converse, Elisha S., Malden.
Converse, Parker L., Woburn.
Coolidge, Joshua, Watertown.
Copeland, Franklin, West Dedham.
Coy, Samuel I., Boston.
Crocker, George O., New Bedford.
Crocker, Uriel, Boston.
Crosby, Josiah, Arlington.
Crowell, Philander, Chelsea.
Crowell, Randall H., Chelsea.
Cummings, John, Woburn.
Curtis, Charles F., Jamaica Plain.
Curtis, George S., Jamaica Plain.
Cushing, Robert M., Boston.

†Daggett, Henry C., Boston.
Damon, Samuel G., Arlington.

Dana, Charles B., Wellesley.
Darling, Charles K., Boston.
Davenport, Edward, Dorchester.
Davenport, George E., Medford.
Davenport, Henry, Boston.
Dawson, Jackson, Jamaica Plain.
Deblois, Stephen G., Boston.
Dee, Thomas W., Mount Auburn.
Denny, Clarence H., Boston.
†Denny, R. S., Dorchester.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dickerman, George H., Somerville.
Dike, Charles C., Stoneham.
Dinsmore, William B., New York, N. Y.
Dorr, George, Dorchester.
Dove, George W. W., Andover.
Durant, William, Boston.
Durfee, Mrs. Fidelia B., Fall River.
Durfee, George B., Fall River.
Dutcher, F. J., Hopedale.

Eaton, Horace, Quincy.
Eldridge, Azariah, Yarmouthport.
†Eldridge, E. H., Roxbury.
Ellicott, Joseph P., Boston.
Endicott, William E., Canton.
Eustis, William C., Hyde Park.
Everett, William, Dorchester.

Fairchild, Charles, Belmont.
Falconer, William, Glencove, N.Y.
Farlow, John S., Newton.
Farlow, Lewis H., Newton.
Farquhar, Robert, Boston.
†Faxon, John, Quincy.
Fay, Mrs. Rebekah L., Chelsea.
Fenno, J. Brooks, Boston.
Fewkes, Arthur H., Newton Highlands.
Fewkes, Edwin, Newton Highlands.
Fillebrown, John, Arlington.
Fisher, David, Newport, R.I.
Fisher, James, San Diego, Cal.
Fisher, Warren, Boston.
Flagg, Augustus, Boston.
Fleming, Edwin, West Newton.
Fletcher, George V., Belmont.
Fletcher, John W., Chelsea.
Fletcher, J. Henry, Belmont.
Flint, Charles L., Boston.
Flint, David B., Watertown.
Flynt, William N., Monson.
Forster, Edward J., M. D., Charlestown.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
Freeman, Abraham, Dorchester.
French, Jonathan, Boston.
French, J. D. Williams, Boston.
Fuller, Henry Weld, Roxbury.

Galvin, John, West Roxbury.
Gardner, Henry N., Belmont.
Gardner, John L., Brookline.
Gibbs, Wolcott, M.D., Cambridge.
Gillard, William, Atlantic.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Reading.
Glover, Albert, Boston.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Mrs. Mary T., Newton.
Goodell, L. W., Amherst.
Gorham, James L., Jamaica Plain.
†Gould, Samuel, Boston.
Gray, James, Wellesley.
Gregory, James J. H., Marblehead.
Greig, George, Toronto, Ont.
Groom, Thomas, Dorchester.
Grundel, Hermann, Dorchester.
Guild, J. Anson, Brookline.

Hadwen, Obadiah B., Worcester.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, George R., Fort George, Fla.
Hall, John R., Roxbury.
Hall, Lewis, Cambridge.
Hall, Stephen A., Revere.
Hall, William F., Brookline.

Halliday, William H., South Boston.
†Hammond, Gardner G., Boston.
Hammond, Samuel, Boston.
Hanson, P. G., Woburn.
Harding, Charles L., Cambridge.
Harding, George W., Arlington.
Harding, Lewis B., Boston.
Harding, William C., Stamford, Ct.
Hardy, F. D., Jr., Cambridgeport.
Harrington, Leonard B., Salem.
Harrington, Nathan D., Somerville.
Harris, Charles, Cambridge.
Hart, William T., Boston.
Hastings, Levi W., Brookline.
Hathaway, Seth W., Marblehead.
†Haughton, James, Boston.
†Haven, Alfred W., Portsmouth, N. H.
Hayes, Daniel F., Exeter, N. H.
Hayes, Mrs. Francis B., Senior, Lexington.
Hayes, Francis B., Lexington.
Hayward, Jonas P., Ashby.
†Hazeltine, Hazen, Boston.
Head, Charles D., Brookline.
Henshaw, Joseph P. B., Boston.
Heywood, George, Concord.
Hilbourn, A. J., Chelsea.
Hill, George, Arlington.
Hill, John, Stoneham.
Hilton, William, Boston.
Hitchings, E. H., Boston.
Hittinger, Jacob, Belmont.
Hoar, Samuel, Concord.
Hodgkins, John E., Chelsea.
†Hollis, George W., Grantville.
Hollis, John W., Allston.
Holt, Mrs. Stephen A., Winchester.
Hooper, Thomas, Bridgewater.
Horner, Mrs. Charlotte N. S., Georgetown.
Hovey, Charles H., Cambridgeport.
Hovey, Charles M., Cambridgeport.
Hovey, John C., Cambridgeport.
Hovey, Stillman S., Woburn.
†Howe, George, Boston.
Hubbard, Charles T., Weston.
Hubbard, Gardner G., Cambridge.
Hubbard, James C., Everett.
†Humphrey, F. J., Dorchester.
Humphrey, George W., Dedham.
Hunneman, Joseph H., Boston.
Hunnewell, Arthur, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Franklin, Boston.
Hunt, Moses, Charlestown.
Hunt, William H., Concord.
Hyde, James F. C., Newton Highlands.

Inches, Herman B., M. D., Boston.

Jackson, Abraham, Boston.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Dorchester.
Janvrin, William S., Revere.
Jeffries, John, Boston.
Jenks, Charles W., Boston.
Johnson, J. Frank, Boston.
Joyce, Mrs. E. S., Medford.

Kakas, Edward, West Medford.
Kelly, George B., Jamaica Plain.
†Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
†Kendall, Joseph R., Oakland, Cal.
Kendrick, Mrs. H. P., Allston.
Kennard, Charles W., Boston.
Kennedy, George G., M. D., Milton.
Kent, John, Charlestown.
†Keyes, E. W., Denver, Col.
Keyes, George, Concord.
Kidder, Nathaniel T., Boston.
†Kimball, A. P., Boston.
King, Franklin, Dorchester.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, John M., East Wareham.
Kinsley, Lyman, Cambridgeport.

Lamb, Thomas, Boston
Lancaster, Charles B., Newton.
Lane, John, East Bridgewater.
Lawrence, Amos A., Boston.

Lawrence, James, Boston.
Lawrence, John, Boston.
Lee, Henry, Boston.
Leeson, Joseph R., Newton Centre.
Lemme, Frederick, Arlington.
Leuchars, Robert B., Boston.
Lewis, A. S., Framingham.
Lewis, William G., Framingham.
Lincoln, George, Hingham.
Locke, William H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, G. Henry, M. D., Boston.
Loftus, John P., North Easton.
Loomis, Jason B., Boston.
Lord, George C., Newton.
Loring, Caleb W., Beverly Farms.
Loring, George B., Salem.
Lovett, George L., West Newton.
†Lowder, John, Watertown.
Lowell, Augustus, Boston.
Luke, Elijah H., Cambridgeport.
Lumb, William, Boston.
Lunt, Charles H., Jamaica Plain.
Lyman, Theodore, Brookline.
Lyon, Henry, Charlestown.

†Mahoney, John, Boston.
Mann, James F., Ipswich.
Mann, Jonathan, Milton.
Manning, Jacob W., Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Reading.
Martin, Darius A., Chelsea.
Martin, John S., Roxbury.
Matthews, Nathan, Boston.
McCarty, Timothy, Providence, R.I.
McClure, John, Revere.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Herbert, Weston.
Merriam, M. H., Lexington.
Merrifield, William T., Worcester.
Metivier, James, Cambridge.
Minton, James, Boston.
Moore, John B., Concord.
Moore, John H., Concord.
Morrill, Joseph, Jr., Roxbury.
†Morse, Samuel F., Boston.
Morse, William A., Boston.
Motley, Thomas, Forest Hills.
Mudge, George A., Portsmouth, N.H.
Munroe, Otis, Boston.

Needham, Daniel, Groton.
Nevins, David, Framingham.
Newman, J. R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, Albert W., Marion.
Nickerson, George A., Dedham.
Norton, Charles W., Allston.
Nourse, Benjamin F., Boston.

Oakman, Hiram A., North Marshfield.
Osgood, James Ripley, Boston.
Oxnard, George D., Boston.

Packer, Charles H., Boston.
†Page, Thomas, Boston.
Paige, Clifton H., Boston.
Palmer, Julius A., Jr., Boston.
Parker, Augustus, Roxbury.
Parker, Mrs. Margaret, Wakefield.
Parkman, Francis, Jamaica Plain.
†Partridge, Henry, Dunkirk, N. Y.
Partridge, Horace, Cambridge.
Paul, Alfred W., Dighton.
Peabody, John E., Salem.
†Pearce, John, West Roxbury.
Peck, O. H., Denver, Col.
Peck, W. G., Arlington.
Peirce, Silas, Boston.
Penniman, A. P., Waltham.
Perkins, Augustus T., Boston.
Perkins, Edward N., Jamaica Plain.
Perkins, William P., Wayland.
†Perry, George W., Malden.
Philbrick, William D., Newton Centre.
Pierce, Dean, Brookline.
Pierce, Henry L., Boston.
Pierce, Samuel B., Dorchester.
Poor, John R., Somerville.
Potter, Joseph S., Arlington.

Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Pratt, William, Winchester.
Pray, Mark W., Boston.
†Prescott, Eben C., Boston.
Prescott, William G., Boston.
Prescott, William G., Quincy.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, Thomas P., West Roxbury.
Prouty, Gardner, Littleton.
Pulsifer, Royal M., Auburndale.
Putnam, Joshua H., Brookline.

Quinby, Hosea M., M.D., Worcester.

Rand, Miss Elizabeth L., Newton Highlands.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Ray, James P., Franklin.
Ray, Joseph G., Franklin.
Reed, George W., Boston.
Richards, John J., Boston.
Richardson, Charles E., Cambridgeport.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Robbins, I. Gilbert, Dorchester.
Robbins, Nathan, Arlington.
Robeson, William R., Boston.
Robinson, John, Salem.
Robinson, Joseph B., Allston.
Rogers, John H., Boston.
Ross, Henry, Newtonville.
Ross, M. Denman, Forest Hills.
Ross, Waldo O., Boston.
Ruddick, William H., M. D., South Boston.
Russell, George, Woburn.
Russell, John E., Leicester.
Russell, Walter, Arlington.

†Sampson, George R., New York, N. Y.
†Sanborn, Amos C., Cambridgeport.
Sanford, Oliver S., Hyde Park.
Sargent, Charles S., Brookline.
Sargent, John O., Lenox Furnace.
Saville, Richard L., Brookline.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Charlestown.
†Scott, Charles, Newton.
Scudder, Charles W., Brookline.
Sears, J. Montgomery, Boston.
Seaver, Nathaniel, East Boston.
Seaver, Robert, Jamaica Plain.
Shaw, Christopher C., Milford, N. H.
Shimmin, Charles F., Boston.
Shorey, John L., Lynn.
Skinner, Francis, Boston.
Smith, Benjamin G., Cambridge.
Smith, Calvin W., Grantville.
Smith, Charles H., Jamaica Plain.
Smith, Chauncey, Cambridge.
Smith, Edward N., San Francisco.
Smith, George O., Boston.
Smith, James H., Needham.
Smith, Whitman B., Roxbury.
Snow, Eben, Cambridge.
Snow, Miss Salome H., Brunswick, Me.
Sparhawk, Edward C., Brighton.
Spaulding, Edward, West Newton.
Spaulding, Mahlon D., Boston.
Speare, Alden, Newton Centre.
Spencer, Alfred W., Boston.
Springall, George, Malden.
Stetson, Nahum, Bridgewater.
Stewart, William J., Winchester.
Stickney, Rufus B., Somerville.
†Stimpson, George, New York, N. Y.
Stimpson, H. H., Cambridge.
Stone, Amos, Everett.
Stone, George F., Newton.
Stone, Phineas J., Charlestown.
Story, E. Augustus, Brighton.
Strong, William C., Newton Highlands.
Sturgis, John H., Brookline.
Sturgis, Russell, Jr., Manchester.
Sturtevant, E. Lewis, M.D., Geneva, N. Y.

Surette, Louis A., Concord.

Taft, John B., Cambridge.
Taylor, Horace B., Boston.
Thurlow, Thomas C., Newburyport.
Tidd, Marshall M., Woburn.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss Harriet S., Boston.
Torrey, Everett, Charlestown.
†Turner, John M., Dorchester.
Turner, Roswell W., Dorchester.
Turner, Royal W., Randolph.

Underwood, Guy C., Roxbury.
Underwood, William J., Belmont.

Vass, William J., Brookline.
Vinal, Miss Mary L., Somerville.
Vose, Benjamin C., Hyde Park.

Wainwright, William L., Braintree.
Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Wales, George O., Braintree.
Walker, Edward C. R., Roxbury.
Walker, Theophilus W., Waltham.
Walley, Mrs. W. P., Boston.
Ward, John, Newton.
Wardwell, William H., Newton Centre.
Ware, Benjamin P., Beach Bluff.
†Warren, George W., Boston.
Washburn, Andrew, Hyde Park.
Wason, Elbridge, Brookline.
Waters, Edwin F., Newton Centre.
Waters, George F., Boston.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Weld, Aaron D., West Roxbury.
Weld, George W., Newport, R. I.
Weld, Moses W., M. D., Boston.
Weld, Richard H., Boston.
Weld, William G., Boston.
West, Mrs. Maria L., Neponset.
Weston, Leonard W., Lincoln.
Weston, Seth, Revere.
Wheelwright, A. C., Boston.
Whipple, John A., Boston.
Whitcomb, William B., Medford.
White, Benjamin C., Boston.
White, Edward A., Boston.
White, Francis A., Brookline.
Whitely, Edward, Cambridgeport.
†Whittle, George W., Somerville.
†Whytal, Thomas G., New York, N. Y.
Wilbur, George B., West Newton.
Wilder, Edward Baker, Dorchester.
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., West Roxbury.
Williams, Aaron D., Boston.
Williams, Benjamin B., Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Henry W., Boston.
Wilson, William Power, Boston.
Woerd, Charles V., Waltham.
Woerd, Charles V., Jr., Waltham.
Wood, Charles G., Boston.
Wood, Luke H., Marlborough.
Wood, R. W., Jamaica Plain.
Wood, William K., West Newton.
Woods, Henry, Boston.
Woodward, Royal, Brookline.
Wright, George C., West Acton.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular will confer a favor by promptly communicating to the Secretary the needed corrections.

Abbot, Samuel L., M. D., Boston.
Abbott, Allen V., Boston.
Aird, Duncan, Belmont.
Allen, Andrew F., Arlington.
Allen, Calvin, Roxbury.
Allen, Charles L., Garden City, N.Y.
Atkinson, Charles M., Brookline.
Atkinson, Edward, Brookline.
Atkinson, William B., Newburyport.

Bacon, Augustus, Roxbury.
Bacon, William, Roxbury.
Badlam, William H., Dorchester.
Barber, J. Wesley, Newton.
Bard, James, Framingham.
Barker, John G., Jamaica Plain.
Batchelder, G. W., St. Albans, Vt.
Beard, Edward L., Cambridge.
Beebe, J. Arthur, Boston.
Beer, Carl, New York, N.Y.
Bird, John L., Dorchester.
Bliss, Benjamin K., Boston.
Bock, William A., North Cambridge.
Bolles, Matthew, Boston.
Bolles, William P., Roxbury.
Bolton, John B., Somerville.
Boott, William, Boston.
Bowditch, E. F., Framingham.
Bowditch, James H., Brookline.
Bowker, Albert, East Boston.
Boyden, Clarence F., Taunton.
Bradlee, John T., Boston.
Breck, Charles H., Brighton.
Breck, Charles H. B., Brighton.
Brooks, George, Brookline.
Brown, Atherton T., Roxbury.
Brown, David H., West Medford.
Brown, Joseph T., Boston.
Burley, Edward, Beverly.
Butler, Edward, Wellesley.

Carter, Miss Maria E., Woburn.
Cartwright, James, Wellesley.
Chaffin, John C., Newton.
Chase, Joseph S., Malden.
Chase, Leverett M., Roxbury.
Cheney, Amos P., Natick.
Clark, James W., Framingham.
Clark, Joseph, Manchester.
Clark, Joseph W., Dedham.
Clark, Theodore M., Newtonville.
Collins, Frank S., Malden.
Comley, James, Lexington.
Crafts, William A., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Daniel T., Milton Lower Mills.
Curtis, Joseph H., Boston.

Davenport, Albert M., Watertown.
Davis, Frederick, Newton.
Davis, Thomas M., Cambridgeport.
De Mar, John A., Brighton.
Ditson, Oliver, Boston.
Dolbear, Mrs. Alice J., College Hill.
Doran, Enoch E., Brookline.
Doyle, William E., East Cambridge.

Duffley, Daniel, Brookline.

Eaton, Jacob, Cambridgeport.

Farrier, Mrs. Cynthia, Stoneham.
Faxon, Edwin, Jamaica Plain.
Faxon, Marshall B., Boston.
Felton, Arthur W., West Newton.
Fenno, Warren, Revere.
Fergusson, Thomas M., Philadelphia, Pa.
Fisher, Sewall, Framingham.
Fletcher, Edwin, Acton.
Forbes, William H., Jamaica Plain.
Foster, Joshua T., Medford.
Fowle, Charles L., Dorchester.
Francis, George E., M.D., Worcester.
French, William E., Boston.
Frohock, Roscoe R., Malden.
Frost, Edward, Littleton.
Frost, George, West Newton.
Frost, Stiles, Newtonville.
Frost, Varnum, Belmont.
Fuller, T. Otis, Needham.

Gardiner, Claudius B., Newburyport.
Gibbon, Mrs. James A., Dorchester.
Gilbert, Samuel, Boston.
Gill, Mrs. E. M., Medford.
Gleason, Herbert, Malden.
Godbold, Gustavus A., Chelsea.
Goddard, Thomas, Boston.
Goodwin, Lester, Brighton.
Gould, William P., Newtonville.
Grant, Charles E., Concord.
Gray, Howard, Dorchester.
Gray, William, Jr., Dorchester.
Greene, Malcolm C., Dorchester.
Grew, Henry, Hyde Park.
Grover, William O., Boston.
Guerineau, Louis, Cambridge.

Hall, William T., Revere.
Hamlin, Delwin A., Allston.
Hammond, Clement M., Hyde Park.
Harris, Miss Ellen M., Jamaica Plain.
Harris, Frederick L., South Natick.
Hartwell, Samuel, Lincoln.
Harwood, George S., Newton.
Hatch, Samuel, Boston.
Hayes, John L., Cambridge.
Hazleton, H. L., Hingham.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren, Belmont.
Hewins, James, Medfield.
Hews, Albert H., North Cambridge.
Hill, Benjamin D., Peabody.
Hill, Edwin S., Hyde Park.
Hill, J. Willard, Belmont.
Hill, Miss Katie A., Belmont.
Howe, Rufus, Marlborough.
Hunt, Henry C., Newton.

Jameson, G. W., East Lexington.
Jones, Moses, Brookline.
Jordan, Samuel, Yarmouth.
Judkins, Rev. B., West Dedham.

Kendall, Jonas, Framingham.
Kenrick, Miss Anna C., Newton.

Lamprell, Simon, Marblehead.
Lang, John H. B., Boston.
Langmaid, Mrs. Mary, Somerville.
Lee, Charles J., Dorchester.
Lee, Francis H., Salem.
Livermore, Miss Maria, Mt. Auburn.
Loring, Charles G., Boston.
Loring, John A., Boston.
Lothrop, David W., West Medford.
Lothrop, H. A., Sharon.
Lothrop, Thornton K., Boston.
Lowell, John, Newton.

Manda, W. A., Cambridge.
Marcou, Mrs. J., Cambridge.
Markoe, George F. H., Roxbury.
Martin, William J., Milton.
May, F. W. G., Boston.
McDermott, Andrew, Roxbury.
McIntosh, Aaron S., Roxbury.
McLaren, Anthony, Forest Hills.
McMillan, Robert, Whitinsville.

Meriam, Horatio C., D.M.D., Salem.
Merrill, J. Warren, Cambridgeport.
Merrill, S. A., Wollaston.
Meston, Alexander, Andover.
Mills, William, Somerville.
Minton, Peter J., Forest Hills.
Morandi, Francis, Malden.
Morandi, Francis W., Malden.
Morton, James H., Mount Hope.
Murray, Daniel D., Brookline.
Muzzey, Rev. Artemas B., Cambridge.

Nelson, Mrs. Thomas L., Worcester.
Nightingale, Rev. Crawford, Dorchester.
Norton, Michael H., Boston.
Norton, Patrick, Boston.

O'Brien, James, Jamaica Plain.

Park, William D., Boston.
Parker, George A., Halifax.
Parker, John, Boston.
Patterson, James, Cambridge.
Payson, Samuel R., Boston.
Peirce, George H., Concord.
Petremant, Robert, Roxbury.
Phillips, Nathaniel, Dorchester.
Pierce, Samuel H., Lincoln.
Plimpton, Willard P., West Newton.
Power, Charles J., South Framingham.
Prince, Thomas, Roxbury.
Purdie, George A., Wellesley Hills.
Putnam, Charles A., Salem.
Putnam, Henry W., Salem.

Randall, Macey, Sharon.
Richards, John S., Brookline.
Richardson, E. P, Lawrence.
Richardson, Horace, M.D. Boston.
Richardson, Spencer W., Boston.
Ridler, Charles E., Boston.
Robbins, Oliver R., Weston
Roberts, Edward, Hyde Park.
Robinson, William, North Easton.
Rogers, Samuel C. B., Jamaica Plain.
Ross, Charles W., Newtonville.

Safford, Nathaniel E., Milton.
Saunders, Miss Mary T., Salem.
Saville, George, Quincy.
Sawtell, J. M., Fitchburg.
Schmitt, Georg A., Wellesley.
Scott, Augustus E., Lexington.
Scott, George H., Allston.
Scott, John W., Nahant.
Scudder, Samuel H., Cambridge.
Sharples, Stephen P., Cambridge.
Shattuck, Frederick R., Roxbury.
Shedd, Abraham B., Weston.
Shedd, Arthur B., Chicago, Ill.
Sheppard, Edwin, Lowell.
Sheppard, Samuel A. D., Newton.
Snow, Eugene A., Melrose.
Snow, Francis B., Dorchester.
Southworth, Edward, Quincy.
Spooner, William H., Jamaica Plain.
Squire, John P., Arlington.
Stearns, Charles H., Brookline.
Stevenson, Hamilton, Woburn.
Stone, Samuel G., Charlestown.
Storer, Charles, Natick.
Story, Miss Sarah W., Brighton.
Strahan, Thomas, Chelsea.
Sullivan, Julius L. D., Somerville.
Swan, Charles W., Boston.

Tailby, Joseph, Wellesley.
Talbot, Josiah W., Norwood.
Teel, William H., West Acton.
Temple, Felker L., Somerville.
Terwilliger, S. F., Saratoga Springs, N. Y.
Tillinghast, Joseph, New Bedford.
Tobey, S. Edwin, Boston.
Torrey, Bradford, Boston.
Trautman, Martin, Boston.
Turner, Nathaniel W. Boston.

Van der Veur, P. W., New York, N.Y.
Vaughan, J. C., Chicago, Ill.

Walker, Charles H., Chelsea.
Walker, Joseph T., Watertown, N.Y.
Walker, William P., Somerville.
Waterer, Hosea, South Natick.

Weld, Christopher M., Jamaica Plain.
Wellington, Miss Caroline, East Lexington.
Wells, Benjamin T., Newton.
Weston, Mrs. L. P., Danvers.
Wheatland, Henry, M.D., Salem.
White, Nelson B., Norwood.
Whitney, Joel, Winchester.
Whiton Starkes, Hingham Centre.
Wilde, Hiram, Randolph.
Wilmarth, Henry D., Jamaica Plain.
Wilson, B. Osgood, Watertown.
Wilson, George W., Malden.
Wiswall, Henry M., Watertown.
Withington, Henry H., Jamaica Plain.
Wolcott, Mrs. Henrietta L. T., Boston.
Wood, Mrs. Anna D., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Newton.
Woolson, George C., Passaic, N. J.
Worthington, Roland, Roxbury.
Wright, Daniel, Lowell.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXVI. — Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member having once paid an admission fee may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII. — Admission Fee and Annual Assessment.

Every subscription member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX. — Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society, and the Treasurer shall erase his name from the List of Members. Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him to the Society.

The attention of Annual Members is particularly called to Section XXIX.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851. *The names of those known to be deceased are marked with a star.*

*Benjamin Abbott, LL. D., Exeter, N. H.

*John Abbott, Brunswick, Me.

*Hon. John Quincy Adams, LL. D., late President of the United States, Quincy.

*Professor Louis Agassiz, Cambridge.

*William T. Aiton, late Curator of the Royal Gardens, Kew, England.

*Thomas Allen, late President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.

*Hon. Samuel Appleton, Boston.

*Hon. James Arnold, New Bedford.

*Edward Nathaniel Bancroft, M. D., late President of the Horticultural and Agricultural Society of Jamaica.

*Hon. Philip P. Barbour, Virginia.

*Don Angel Calderon de la Barca, late Spanish Minister at Washington.

*Robert Barclay, Bury Hill, Dorking, Surrey, England.

*James Beekman, New York.

*L'Abbé Berlèse, Paris.

*Nicholas Biddle, Philadelphia.

*Dr. Jacob Bigelow, Boston.

*Mrs. Lucy Bigelow, Medford.

*Le Chevalier Soulange Bodin, late Secrétaire Général de la Société d'Horticulture de Paris.

Hon. George S. Boutwell, Groton.

*Josiah Bradlee, Boston.

*Hon. George N. Briggs, Pittsfield.

*Hon. James Buchanan, late President of the United States, Lancaster, Penn.

*Hon. Jesse Buel, late President of the Albany Horticultural Society, Albany, N. Y.

*Hon. Edmund Burke, late Commissioner of Patents, Washington, D. C.

*Augustin Pyramus de Candolle, Geneva, Switzerland.
*Hon. Horace Capron, late U. S. Commissioner of Agriculture, Washington, D. C.
*Commodore Isaac Chauncey, U. S. Navy, Brooklyn, N. Y.
*Ward Chipman, late Chief-Justice of New Brunswick, St. John.
*Lewis Clapier, Philadelphia.
*Hon. Henry Clay, Lexington, Ky.
H. W. S. Cleveland, Minneapolis, Minn.
*Admiral Sir Isaac Coffin, Bart., England.
*Zaccheus Collins, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Roswell L. Colt, Paterson, N. J.
Caleb Cope, ex-President of the Pennsylvania Horticultural Society, Philadelphia.
*William Coxe, Burlington, N. J.
*John P. Cushing, Watertown.
*Charles W. Dabney, late U. S. Consul, Fayal, Azores.
*Hon. John Davis, LL. D., Boston.
*Sir Humphry Davy, London.
*Gen. Henry Alexander Scammel Dearborn, Roxbury.
*James Dickson, late Vice-President of the Horticultural Society of London.
*Mrs. Dorothy Dix, Boston.
*Capt. Jesse D. Elliot, U. S. Navy.
*Hon.-Stephen Elliot, LL. D., Charleston, S. C.
*Hon. Henry L. Ellsworth, late Commissioner of Patents, Washington, D. C.
*Allyn Charles Evanson, late Secretary of the King's County Agricultural Society, St. John, N. B.
*Hon. Edward Everett, LL. D., Boston.
*Hon. Horace Everett, Vermont.
*F. Faldermann, late Curator of the Imperial Botanic Garden, St. Petersburg.
*Hon. Millard Fillmore, late President of the United States, Buffalo, N.Y.
*Dr. F. E. Fischer, late Professor of Botany at the Imperial Botanic Garden, St. Petersburg.
*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society, New Brunswick, New Jersey.
*Joseph Gales, Jr., late Vice-President of the Horticultural Society, Washington, D. C.
*George Gibbs, New York.
*Stephen Girard, Philadelphia.
*Hon. Robert T. Goldsborough, Talbot County, Maryland.
*Ephraim Goodale, South Orrington, Maine.
*Mrs. Rebecca Gore, Waltham.
*Hon. John Greig, late President of the Domestic Horticultural Society, Canandaigua, N. Y.

*Mrs. Mary Griffith, Charlieshope, N. J.
*Gen. William Henry Harrison, late President of the United States, North Bend, Ohio.
*S. P. Hildreth, M. D., Marietta, Ohio.
*Thomas Hopkirk, late President of the Glasgow Horticultural Society.
*David Hosack, M. D., late President of the New York Horticultural Society.
*Lewis Hunt, Huntsburg, Ohio.
*Joseph R. Ingersoll, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Gen. Andrew Jackson, late President of the United States, Nashville, Tenn.
*Mrs. Martha Johonnot, Salem.
*Jared Potter Kirtland, M. D., LL.D., East Rockport, Ohio.
*Thomas Andrew Knight, late President of the Horticultural Society of London.
*Gen. La Fayette, La Grange, France.
*Le Comte de Lasteyrie, late Vice-President of the Horticultural Society of Paris.
L. A. H. Latour, M. P., Montreal, Canada.
*Baron Justus Liebig, Giessen, Germany.
*Professor John Lindley, late Secretary of the Horticultural Society of London.
*Franklin Litchfield, late U. S. Consul at Puerto Cabello, Venezuela.
*Joshua Longstreth, Philadelphia.
*Nicholas Longworth, Cincinnati, Ohio.
*Jacob Lorillard, late President of the New York Horticultural Society.
*John Claudius Loudon, London.
*Hon. John A. Lowell, Boston.
*Baron Charles Ferdinand Henry Von Ludwig, late Vice-President of the South African Literary and Scientific Institution, Cape Town, Cape of Good Hope.
*Hon. Theodore Lyman, Brookline.
Col. Theodore Lyman, Brookline.
*Hon. James Madison, late President of the United States, Montpelier, Va.
*Mrs. Charlotte Maryatt, Wimbledon, near London.
Joseph Maxwell, Rio Janeiro.
*D. Smith McCauley, late U. S. Consul-General at Tripoli, Philadelphia.
*Hon. Isaac McKim, late President of the Horticultural Society of Maryland, Baltimore.
Rev. James H. Means, Dorchester, Mass.
*James Mease, M. D., Philadelphia.
*Lewis John Mentens, Brussels, Belgium.
*Hon. Charles F. Mercer, Virginia.
*François André Michaux, Paris.
Donald G. Mitchell, New Haven, Conn.
*Samuel L. Mitchill, M. D., LL.D., New York.

*Hon. James Monroe, late President of the United States, Oak Hill, Va.
*Alfred S. Monson, M. D., late President of the New Haven Horticultural Society, New Haven, Conn.
*Hon. A. N. Morin, Montreal, Canada.
*Théodore Mosselmann, Antwerp, Belgium.
Baron R. Von Osten Sacken, Heidelberg, Germany.
*Baron Ottenfels, late Austrian Minister to the Ottoman Porte.
*John Palmer, Calcutta.
*Hon. Joel Parker, LL. D., Cambridge.
Samuel B. Parsons, Flushing, N. Y.
*Hon. Thomas H. Perkins, Brookline.
*A. Poiteau, late Professor in the Institut Horticole de Fromont.
*Hon. James K. Polk, late President of the United States, Nashville, Tenn.
*John Hare Powel, Powelton, Pa.
*Henry Pratt, Philadelphia.
*William Prince, Flushing, N. Y.
*Rev. George Putnam, D. D., Roxbury.
*Col. Joel Rathbone, late President of the Albany and Rensselaer Horticultural Society, Albany, N. Y.
*Archibald John, Earl of Roseberry, late President of the Caledonian Horticultural Society.
*Joseph Sabine, late Secretary of the Horticultural Society of London.
*Don Ramon de la Sagra, Havana, Cuba.
*Henry Winthrop Sargent, Fishkill, N. Y.
*Sir Walter Scott, Abbotsford, Scotland.
*John Shepherd, late Curator of the Botanic Garden, Liverpool, England.
*John S. Skinner, late Editor of the American Farmer, Baltimore, Md.
George W. Smith, Boston.
*Stephen H. Smith, late President of the Rhode Island Horticultural Society.
*Hon. Charles Sumner, Boston.
*Hon. John Taliaferro, Virginia.
*Gen. James Talmadge, late President of the American Institute, New York.
*Gen. Zachary Taylor, late President of the United States, Baton Rouge, La.
*James Thacher, M. D., Plymouth.
John J. Thomas, Union Springs, N. Y.
*James W. Thompson, M. D., Wilmington, Del.
*Grant Thorburn, New York.
*M. Du Petit Thouars, Paris.
*Le Vicomte Héricart De Thury, late President of the Horticultural Society of Paris.
*Mons. Tougard, late President of the Horticultural Society of Rouen, France.
*Gen. Nathan Towson, late President of the Horticultural Society, Washington, D. C.

*Hon. John Tyler, late President of the United States, Williamsburg, Va.
*Rev. Joseph Tyso, Wallingford, England.
*Hon. Martin Van Buren, late President of the United States, Kinderhook, N. Y.
*Federal Vanderburg, M. D., New York.
*Jean Baptiste Van Mons, M. D., Brussels, Belgium.
*Gen. Stephen Van Rensselaer, Albany, N. Y.
*Joseph R. Van Zandt, Albany, N. Y.
*Benjamin Vaughan, M. D., Hallowell, Me.
*Petty Vaughan, London.
*Rev. N. Villeneuve, Montreal, Canada.
*Pierre Philippe André Vilmorin, Paris.
*James Wadsworth, Geneseo, N. Y.
*Nathaniel Wallich, M. D., late Curator of the Botanic Garden, Calcutta.
*Malthus A. Ward, M. D., late Professor in Franklin College, Athens, Ga.
*Hon. Daniel Webster, Marshfield.
*Hon. John Welles, Boston.
*Jeremiah Wilkinson, Cumberland, R. I.
Hon. Robert C. Winthrop, Boston.
*Frederick Wolcott, Litchfield, Conn.
*Ashton Yates, Liverpool, England.
*Lawrence Young, late President of the Kentucky Horticultural Society, Louisville.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829, S. Reynolds, M.D., 1832, *and* Francis Summerest, 1833. *The names of those known to be deceased are marked with a star.*

*John Adlum, Georgetown, D. C.

*Don Francisco Aguilar y Leal, late U. S. Vice-Consul at Maldonado, Banda Oriental del Uruguay.

*Mons. Alfroy, Lieusaint, France.

A. B. Allen, New York.

*James T. Allen, late President of the Nebraska State Horticultural Society, Omaha.

*Rev. Thomas D. Anderson, D. D., South Boston.

*Thomas Appleton, late U. S. Consul at Leghorn, Italy.

*Col. Thomas Aspinwall, late U. S. Consul at London, Brookline.

P. M Augur, State Pomologist, Middlefield, Conn.

*Isaac Cox Barnet, late U. S. Consul at Paris.

Patrick Barry, First Vice-President of the American Pomological Society, Rochester, N. Y.

*Augustine Baumann, Bolwiller, Alsace.

*Eugéne Achille Baumann, Rahway, N. J.

*Joseph Bernard Baumann, Bolwiller, Alsace.

Napoleon Baumann, Bolwiller, Alsace.

D. W. Beadle, St. Catherine's, Ontario.

Professor William J. Beal, Lansing, Michigan.

*Noel J. Becar, Brooklyn, N. Y.

*Edward Beck, Worton College, Isleworth, near London.

Rev. Henry Ward Beecher, Peekskill, N. Y.

*Louis Édouard Berckmans, Rome, Ga.

Prosper J. Berckmans, Augusta, Ga.

*Alexander Bivort, late Secretary of the Société Van Mons, Fleurus, Belgium.

*Tripet Le Blanc, Paris.

*Charles D. Bragdon, Pulaski, Oswego Co., N. Y.

*William D. Brinckle, M. D., Philadelphia.

*George Brown, late U. S. Commissioner to the Sandwich Islands, Beverly.

*John W. Brown, Fort Gaines, Ga.
*Dr. Nehemiah Brush, East Florida.
*Arthur Bryant, Sr., late President of the Illinois State Horticultural Society, Princeton.
*Robert Buist, Philadelphia.
*Dr. E. W. Bull, Hartford, Conn.
William Bull, Chelsea, England.
Rev. Robert Burnet, ex-President of the Ontario Fruit Growers' Association, Burlington.
Alexander Burton, United States Consul at Cadiz, Spain, Philadelphia.
Isidor Bush, Bushberg, Jefferson Co., Mo.
George W. Campbell, Delaware, Ohio.
*Francis G. Carnes, New York.
*Col. Robert Carr, Philadelphia.
*Rev. John O. Choules, D. D., Newport, R. I.
*Rev. Henry Colman, Boston.
*James Colvill, Chelsea, England.
Benjamin E. Cotting, M. D., Boston.
*Samuel L. Dana, M. D., Lowell.
*J. Decaisne, late Professeur de Culture au Muséum d'Histoire Naturelle, Jardin des Plantes, Paris.
*James Deering, Portland, Me.
*H. F. Dickehut.
*Sir C. Wentworth Dilke, Bart., London.
*Hon. Allen W. Dodge, Hamilton.
Rev. H. Honywood D'Ombrain, Westwell Vicarage, Ashford, Kent, England.
*Andrew Jackson Downing, Newburg, N. Y.
*Charles Downing, Newburg, N. Y.
Parker Earle, Cobden, Ill.
*F. R. Elliott, late Secretary of the American Pomological Society, Cleveland, Ohio.
George Ellwanger, Rochester, N. Y.
*George B. Emerson, LL. D., Winthrop.
*Ebenezer Emmons, M. D., Williamstown.
*Andrew H. Ernst, Cincinnati, O.
*Nathaniel Fellows, Cuba.
*Henry J. Finn, Newport, R. I.
*Willard C. Flagg, late Secretary of the American Pomological Society, Moro, Ill.
*Michael Floy, late Vice-President of the New York Horticultural Society, New York City.
*John Fox, Washington, D. C.
*Hon. Russell Freeman, Sandwich.
Andrew S. Fuller, Ridgewood, N. J.
Henry Weld Fuller, Roxbury.
Hon. Robert W. Furnas, President of the Nebraska State Horticultural Society, Brownville.

*Augustin Gande, late President of the Horticultural Society, Department of the Sarthe, France.
*Robert H. Gardiner, Gardiner, Me.
*Benjamin Gardner, late U. S. Consul at Palermo, Sicily.
*Capt. James T. Gerry, U. S. Navy.
*Abraham P. Gibson, late U. S. Consul at St. Petersburg.
*R. Glendinning, Chiswick, near London.
Professor George L. Goodale, Cambridge.
*George W. Gordon, late U. S. Consul at Rio Janeiro, Boston.
Professor Asa Gray, Cambridge.
Obadiah B. Hadwen, ex-President of the Worcester County Horticultural Society, Worcester.
*Charles Henry Hall, New York.
*Abraham Halsey, late Corresponding Secretary of the New York Horticultural Society, New York.
*Dr. Charles C. Hamilton, late President of the Fruit Growers' Association and International Show Society of Nova Scotia, Cornwallis.
*Rev. Thaddeus Mason Harris, D. D., Dorchester.
*Thaddeus William Harris, M. D., Cambridge.
*John Hay, late Architect of the Caledonian Horticultural Society.
*Bernard Henry, late U. S. Consul at Gibraltar, Philadelphia.
Shirley Hibberd, Editor of the Gardeners' Magazine, London.
*J. J. Hitchcock, Baltimore.
Robert Hogg, LL. D., Editor of the Journal of Horticulture, London.
*Thomas Hogg, New York.
Thomas Hogg, New York.
J. C. Holding, ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.
Rev. S. Reynolds Hole, Caunton Manor, Newark-upon-Trent, Nottinghamshire, England.
Sir Joseph Hooker, K. C. S. I., The Camp, Sunningdale, England.
Josiah Hoopes, West Chester, Pa.
Professor E. N. Horsford, Cambridge.
*Sanford Howard, Chicago, Ill.
*Dr. William M. Howsley, late President of the Kansas State Horticultural Society, Leavenworth.
*Isaac Hunter, Baltimore, Md.
*Isaac Hurd, Cincinnati, Ohio.
George Husmann, Napa, Cal.
*Professor Isaac W. Jackson, Union College, Schenectady, N. Y.
*Thomas P. James, Cambridge.
*Edward Jarvis, M. D., Dorchester.
J. W. P. Jenks, Middleborough.
William J. Johnson, M. D., Fort Gaines, Ga.
Charles Joly, Vice-President of the Société d'Horticulture de France, Paris.
Samuel Kneeland, M. D., Boston.

*Mons. Laffay, St. Cloud, near Paris, France.
*David Landreth, late Corresponding Secretary of the Pennsylvania Horticultural Society, Bristol, Pa.
C. C. Langdon, Mobile, Alabama.
*Dr. William LeBaron, late State Entomologist, Geneva, Ill.
Max Leichtlin, Baden-Baden, Germany.
G. F. B. Leighton, President of the Norfolk Horticultural and Pomological Society, Norfolk, Va.
Victor Lemoine, Nancy, France.
*E. S. H. Leonard, M. D., Providence, R. I.
*André Leroy, Author of the Dictionnaire de Pomologie, Angers, France.
J. Linden, Ghent, Belgium.
*Hon. George Lunt, Scituate.
*F. W. Macondray, San Francisco, Cal.
*James J. Mapes, LL. D., Newark, N. J.
*A. Mas, late President of the Horticultural Society, Bourg-en-Bresse, France.
Dr. Maxwell T. Masters, Editor of the Gardeners' Chronicle, London.
*James Maury, late U. S. Consul at Liverpool, England.
T. C. Maxwell, Geneva, N. Y.
*William Sharp McLeay, New York.
*James McNab, late Curator of the Botanic Garden, Edinburgh, Scotland.
Thomas Meehan, Editor of the Gardener's Monthly, Germantown, Pa.
*Allan Melvill, New York.
*John Miller, M. D., late Secretary of the Horticultural and Agricultural Society of Jamaica.
*Stephen Mills, Flushing, N. Y.
*Charles M'Intosh, Dalkeith Palace, near Edinburgh.
Joseph E. Mitchell, President of the Pennsylvania Horticultural Society, Philadelphia.
*Giuseppe Monarchini, M. D., Canea, Isle of Candia.
*Édouard Morren, Editor of the Belgique Horticole, Liège, Belgium.
*Horatio Newhall, M. D., Galena, Ill.
*David W. Offley, late U. S. Consular Agent at Smyrna, Turkey.
*James Ombrosi, late U. S. Consul at Florence, Italy.
*John J. Palmer, New York.
*Victor Paquet, Paris.
*John W. Parker, late U. S. Consul at Amsterdam, Holland.
*André Parmentier, Brooklyn, N. Y.
William Paul, Waltham Cross, London, N.
*Sir Joseph Paxton, M. P., Chatsworth, England.
*John L. Payson, late U. S. Consul at Messina, Sicily.
*Com. Matthew C. Perry, U. S. Navy, Charlestown.
*David Porter, late U. S. Chargé d' Affaires at the Ottoman Porte, Constantinople.
*Alfred Stratton Prince, Flushing, N. Y.
*William Robert Prince, Flushing, N. Y.

P. T. Quinn, Newark, N. J.
*Rev. W. F. Radclyffe, London, England.
*William Foster Redding, Baltimore, Md.
D. Redmond, Ocean Springs, Miss.
Dr. Edward Regel, St. Petersburg, Russia.
S. Reynolds, M. D., Schenectady, N. Y.
*John H. Richards, M. D., Illinois.
Charles V. Riley, Entomologist to the U. S. Department of Agriculture, Washington, D. C.
*Mons. J. Rinz, Jr., Frankfort-on-the-Main, Germany.
*Thomas Rivers, Sawbridgeworth, Herts, England.
William Robinson, Editor of The Garden, London.
*Bernhard Roeser, M. D., Bamberg, Bavaria.
*Dr. J. Smith Rogers, New York.
*Capt. William S. Rogers, U. S. Navy.
*Thomas Rotch, Philadelphia.
*George R. Russell, Roxbury.
John B. Russell, Newmarket, N. J.
*Rev. John Lewis Russell, Salem.
William Saunders, Department of Agriculture, Washington, D. C.
*William Shaler, late U. S. Consul-General at Havana, Cuba.
*William Shaw, New York.
*Caleb R. Smith, Burlington, N. J.
*Daniel D. Smith, Burlington, N. J.
*Gideon B. Smith, late Editor of the American Farmer, Baltimore, Md.
*John Jay Smith, Germantown, Penn.
*Horatio Sprague, late U. S. Consul at Gibraltar.
Robert W. Starr, Port William, Nova Scotia.
Dr. Joseph Stayman, Leavenworth, Kansas.
*Capt. Thomas Holdup Stevens, U. S. Navy, Middletown, Conn.
*William Fox Strangeway, late British Secretary of Legation at Naples, Italy.
Dr. J. Strentzel, Martinez, Cal.
*Judge E. B. Strong, Rochester, N. Y.
*James P. Sturgis, Canton, China.
William Summer, Pomaria, S. C.
Francis Summerest.
*Professor Michele Tenore, late Director of the Botanic Garden at Naples, Italy.
*James Englebert Teschemacher, Boston.
*Robert Thompson, Chiswick, near London.
*George C. Thorburn, New York.
Professor George Thurber, Editor of the American Agriculturist, New York.
*John Tilson, Jr., Edwardsville, Illinois.
*Cav. Doct. Vincenzo Tineo, late Director of the Botanic Garden at Palermo.

*Luther Tucker, late Editor of the Cultivator, Albany, N. Y.
*Carey Tyso, Wallingford, England.
*Louis Van Houtte, Ghent, Belgium.
*Alexander Vattemare, Paris.
H. J. Veitch, Chelsea, England.
*Emilien de Wael, late Secretary of the Horticultural Society, Antwerp, Belgium.
*John A. Warder, M. D., late President of the Ohio State Horticultural Society, North Bend, Ohio.
Anthony Waterer, Knapp Hill, near Woking, Surrey, England.
*J. Ambrose Wight, late Editor of the Prairie Farmer, Chicago, Ill.
Benjamin Samuel Williams, Upper Holloway, London, N.
Professor John Wilson, Edinburgh University, Scotland.
*William Wilson, New York.
*Hon. J. F. Wingate, Bath, Me.
*Gen. Joshua Wingate, Portland, Me.
*Joseph Augustus Winthrop, Charleston, S. C.

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1887.

PART I.

BOSTON:
PRINTED FOR THE SOCIETY.
1887.

Marshall P. Wilder

PRESIDENT OF THE AMERICAN PUBLIC [illegible] SOCIETY

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR

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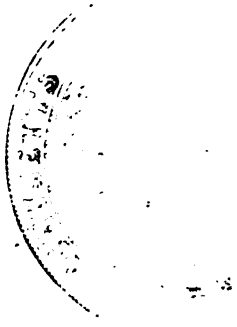

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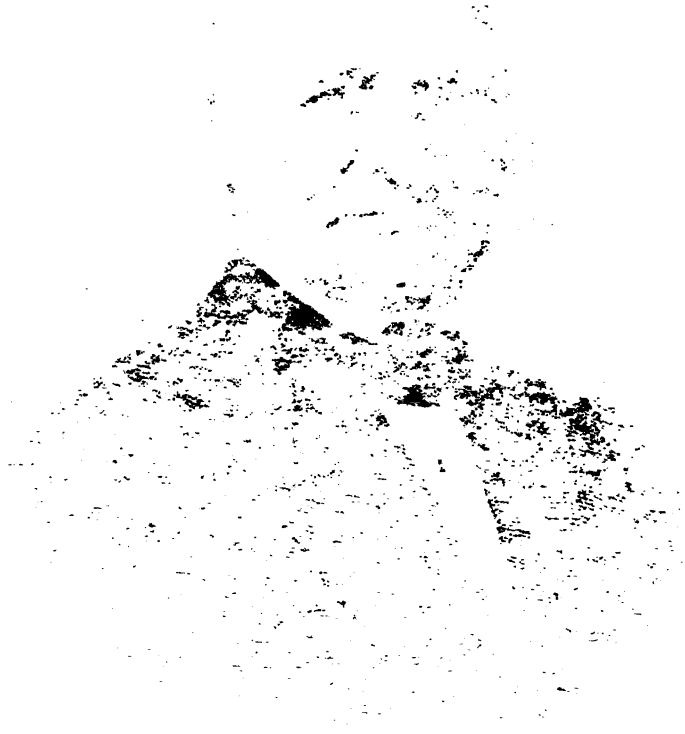

Hendrick P. Vitéle

TRANSACTIONS

OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1887.

PART I.

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The following papers and discussions have been circulated to some extent in the form of slips reprinted from the reports made by the Secretary of the Society in the Boston Transcript. As here presented, the papers are printed in full, and the discussions are not only much fuller than in the weekly reports, but, where it appeared necessary, have been carefully revised by the speakers.

The Committee on Publication and Discussion take this opportunity to repeat what they have before stated, that the Society is not to be held responsible for the certainty of the statements, the correctness of the opinions, or the accuracy of the nomenclature in the papers and discussions now or heretofore published, all of which must rest on the credit or judgment of the respective writers or speakers, the Society undertaking only to present these papers and discussions, or the substance of them, correctly.

O. B. Hadwen,
William H. Hunt,
Francis H. Appleton,
} *Committee on Publication and Discussion.*

TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, January 1, 1887.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

This being the commencement of the term of office of the new board of officers and standing committees, the President delivered the usual annual address, as follows:

ADDRESS OF PRESIDENT WALCOTT.

Members of the Massachusetts Horticultural Society:

We are met here once more to review hastily the history of the past year, and to draw from it such lessons as we may, for future guidance.

But we miss one who, through more years than many of us have lived, has been an honored leader in this Society; to whose wisdom, firmness, and fair dealing, in more than one season of impending trouble, this organization has owed very much. Ex-President Wilder became a member of this Society in 1830, about a year from the date of its incorporation. He very soon became a recognized power here, and continued to the end one of our most active associates. In a life devoted to the science and practice of horticulture in all its branches, his more conspicuous services were, perhaps, in the department of pomology; and in this he was pre-eminent, not only in this State but also in the nation. His interest in all our concerns was permanent, nor did he permit the burden, easily borne in truth, of more than fourscore years to interfere with an active participation in the administration of our affairs.

His counsel, cheerfully given, never obtruded, was remarkable in this—that full account was taken of the wants of the present day, and the facts of advance were recognized, and, dispassionately comparing them with the past, he believed that substantial improvements had been made, and that we were on the road to still greater achievement.

The future readers of the history of the Society will find it difficult to believe that this man, so prominent in our records, was equally conspicuous in many other organizations, and was at the same time a busy merchant of the city of Boston. But he illustrated the best charm of horticulture, the relief afforded by it to the tired man of business and to the wearied student. The changes of nature were even more attractive to him than the triumphs of public life.

A fund established by the provisions of his will — by which medals are annually to be given for the encouragement of the cultivation of certain fruits — will forever be associated with his name.

> "Of no distemper, of no blast he died,
> But fell like autumn fruit that mellowed long."

It is my good fortune to be able to repeat this year the favorable financial statement of last year, and I have the pleasure of announcing to you, that on December 1st we were able to pay $30,000 of the mortgage debt of $60,000 which matures in the fall of 1888, and that our only indebtedness today which is not fully provided for by cash in the hands of the Treasurer is the balance of the mortgages, $30,000, and the Stickney Fund of $12,000, due Harvard College in 1899.

Though the Treasurer's accounts cannot be fully presented thus early in the year, it can be stated that the receipts are greater than those of the year 1885 by about $4,000, while the expenditures exceed those of 1885 by about $1,000.

The occupation of the halls by the Japanese and Aztec villages through many weeks has fortunately contributed to give us a larger income than usual, but I must again remind the Society that the conditions of property of this sort, in this portion of the city, have so far changed in recent years, that we must not be surprised at a permanent depreciation of the value of the halls for such purposes as can with propriety be permitted by the Society.

The exhibitions of the year have, upon the whole, been success-

ful; the Spring Exhibition and the Rose Show markedly so. The Annual Exhibition was, even in the absence of one of the most important collections generally shown, crowded with plants of the first merit, that should have had, for a becoming display, three times the floor space that could in our present quarters be given to them.

The Chrysanthemum Exhibition, in illustration perhaps of one of those changes in popular taste which so often occur, did not bring in the usual number of visitors; nor was the show itself equal to those of preceding years — not from lack of skill on the part of our growers, but rather from some unknown climatic conditions of such general influence that collections of this plant appear to have suffered all over this State at least.

The weekly exhibitions through the summer attracted more visitors than ever before, and were of superior merit to those of former years.

Several exhibitors brought to the halls, week after week, collections of our native plants and flowers, unequalled hitherto in number or in the varieties exhibited. Many of them would be valuable additions to our gardens, and all of them were objects of interest.

It seems to me altogether fortunate that we have been able to attract to our halls those lovers of our native plants who have neither the money nor the time to enable them to make botanizing expeditions into the country; and on the other hand to show to another class what they might discover if they expended time and money in a tour through our suburbs; and lastly, very many have examined these displays thoroughly for the purpose of improving their knowledge of our native plants, and learning the correct names for specimens which they may have themselves collected.

The Botanic Garden of Harvard College has made, through the year, a series of valuable and instructive exhibitions. The authorities of the garden have wisely and considerately abstained from the competitions for prizes. It is to be hoped that they will feel encouraged by the success of the past season to go on with the exhibition here of objects of horticultural interest, and that they may also see the way clear to come to us as teachers in some of the many unanswered questions of plant cultivation.

We should moreover have a better knowledge of the diseases of plants. Up to a very recent period we have been satisfied, or rather have been forced to content ourselves, with the study of

disease in its grosser forms — not in the vegetable kingdom alone but in man as well. For instance, we have called a new or foreign growth in the human body by some strange name that generally has only denoted some peculiarity of form or color—the name itself being as irrational as those of some of the Flemish pears. In the same way, again, a certain diseased change in the plum tree has been called a "black knot," and this was the end of it. Whether an insect produced it or not was one of the vexed questions, never answered to general satisfaction, because we had not attained to the methods of exact investigation. We do know now that organisms exist, powerful enough in their unhindered reproduction to sweep away the human race even, and that they exist in forms so minute that they can be discovered only by the most powerful microscope. In this field, therefore, we are beyond aid from the simple observations of the naked eye — we must go to the laboratory of the scientific observer; and I will suggest, for your consideration, whether it will not be well to look forward to the time when, with improved financial conditions, our debt paid, we may do something to help on that scientific work for which our wise fathers seem to have made some provision, in constituting as permanent officers of the Society professors of Botany and Entomology.

It has been suggested, and the proposition seems to me worthy of favorable consideration, that we should gain something in our larger exhibitions by securing, in addition to our standing committees for awarding prizes, the services of distinguished experts from other sections of our country. These experts would, in the nature of things, have standards somewhat different from our own — possibly better, perhaps not as good; but would offer in any competition the guaranty of a disposition on our part to recognize a competent expression of opinion wherever formed. Of course these gentlemen would not be exhibitors, and while it would be a serious loss to our shows if our own judges should be precluded from exhibiting, it does not seem altogether reasonable that they should be competitors, however stringent the rules may be which forbid their taking any part in the determination of awards to the objects exhibited by themselves. It seems to me worthy also of your consideration, whether their arduous services should not receive some compensation in money. With the best constituted prize committees — and the committees of this Society have never dis-

appointed our just confidence in their integrity — there comes into existence a certain local quality, which leads even the honest man to adhere to the established views of things simply because they are the regular fashions of thought; to get into ruts; to award a prize to plants or flowers or fruits because they are as good as similar specimens formerly exhibited. I think we should insist upon improvement if possible; the giving of a prize to a certain degree of merit this year should not be allowed to be, in any sense, a guaranty for such recognition in a succeeding year. The conditions of cultivation remaining the same, let no first prize be awarded except for distinguished merit. Give to our awards that critical quality that shall make a certificate of merit valuable in commerce, as is that of the London Society. It is a complaint in these days that exhibitors care for nothing but the money prizes; may it not in some instances be true that this award has become the only one with a real value? The small sum that goes to the making of a silver medal can be made more worthy of competition than our highest money prize; let us strive to make it so.

At our last annual meeting I called your attention to the fact that our larger exhibitions had outgrown the capacity of these halls. The experience of the past season reënforces all the arguments then used in behalf of some better provision for these more important shows. A committee of members eminently well qualified to consider this subject have, after mature deliberation, recommended to the Society that an effort be made to procure an open piece of ground of at least fifteen thousand square feet, in a convenient situation, for the purpose of erecting thereon a tent or some structure conveniently arranged for the reception and exhibition of large plants; a smaller permanent building in connection with the above to be used for the general purposes of the Society and the smaller exhibitions. If the Society were obliged to purchase this amount of real estate, while it would under existing laws be relieved from taxation, there would still be a heavy burden imposed upon funds devoted most unselfishly to the public education and enjoyment. I sincerely hope that some plan may be devised for helping this Society to enlarge to the utmost its useful work of bringing into the crowded city the refining influences of horticulture.

The Society has made a most generous provision for prizes to be awarded at the Annual Exhibition of this year, which is to be held

in conjunction with the American Pomological Society, and at large expense has procured the use of the building of the Massachusetts Charitable Mechanics' Association for the better accommodation of the united exhibitions. It is matter of doubt, of course, whether the receipts will be sufficiently increased to defray the added expenses; but we must accept in compensation the hope of doing something to encourage the improvement of this most important branch of horticulture; we shall at least be enabled to renew or make the acquaintance of the men who are doing so much for pomology all over our country.

The library still increases in size and usefulness under the devoted and intelligent care of the librarian and its standing committee. Unfortunately the inconveniences of the library room become in an equal degree more noticeable.

In conclusion, allow me, in the name of the Society, to thank our Standing Committees, the Secretary and Librarian, the Treasurer and the assistants employed in the building, for their continued faithful and valuable services.

William C. Strong, Chairman of the Committee charged with preparing a fit expression of the Society's regard for the late Hon. Marshall P. Wilder, reported the following:

Memorial of Hon. Marshall P. Wilder.

For fifty-six years, lacking but a single year of the entire lifetime of the Society, Marshall Pinckney Wilder has been a constant and an active member. Indeed, we have been so accustomed to expect his benign presence at all our meetings that his loss seems for the present to change the very character of our Society.

Quorum pars magna fui! With special appropriateness might he have adopted these words of the Roman poet, as applied to his connection with this Society. It is, therefore, with no ordinary emotion that we recommend the adoption of the following as an expression of the sentiment of the Society:

In the gift of the long and preëminently useful life of Marshall Pinckney Wilder, the Massachusetts Horticultural Society recognizes the benevolent hand of the Giver of all Good. A specially kind Providence seems to have smiled upon his enthusiastic love of Nature and his efforts to develop the works of the Creator. With gratitude do we acknowledge the wide and lasting influence which Mr. Wilder has exerted in his favorite pursuit of horticul-

ture; an influence of which this vicinity has had the near and special benefit, but which has also extended beyond the limits of our State and country, and is recognized wherever our art is known. We shall cherish the memory of his unflagging zeal in every branch of horticulture, his example in skilful cultivation, his constant attendance, and his wise and kindly words of encouragement. While painfully conscious that these halls can never more welcome his presence, we turn from this sad thought to dwell upon the fact that his was a completed life, that he had filled up the measure of usefulness to the full, and that he was gathered like a shock of corn fully ripe in its season.

Who can doubt that in humble trust he has entered the paradise of God, and that in company with those he loved he is now engaged in higher pursuits, yet it may be still kindred with those that were the joy of his earthly life. Let it be our aim to be animated by his noble example.

To the family of the deceased the Society extends its profound sympathy in their sorrow.

WILLIAM C. STRONG,
CHARLES M. HOVEY,
JAMES F. C. HYDE,
ROBERT MANNING,
EDWARD L. BEARD,
} *Committee.*

In presenting this memorial Mr. Strong added that—

To the active members of this Society Mr. Wilder was so well known that it seems superfluous to speak of the traits of character which so distinguished and endeared him to us. Yet it is well for us to dwell upon his example, that we may get such clear and fixed impressions as shall be helpful to each of us in worthy living.

Mr. Wilder was born to be a leader. At the early age of twenty-one he was chosen captain of a military company, and at twenty-six years of age he was colonel of a regiment.

When first elected to the Senate of this Commonwealth, it was not deemed necessary that he should become familiar with the routine of business, but contrary to all custom he was at once selected as presiding officer. And thus it has been with the numerous societies which he has either formed or with which he has been connected. In all these he has advanced to the front rank. In every enterprise which engaged his attention his enthusiasm was at

once enlisted and his persistent ability and inspiring presence speedily placed him at the head.

Others will dwell upon the traits which gave him success in the various fields of his usefulness. We turn rather to notice his characteristics in his favorite pursuit of horticulture. In this he is best known. Here he did his best service for his fellow men. It was, indeed, a favorite pursuit—a genuine love. While engaged in large commercial business he yet found time for the extensive importation and cultivation of a great variety of hardy and exotic fruits, plants, and agricultural products, being one of the earliest introducers, and always on the alert to obtain and test new kinds. This enthusiasm was lifelong, and was as hearty in the cultivation of pæonies as pears; or in the case of camellias or dahlias or azaleas as of raspberries and strawberries. Undeniably he was stimulated by a desire to exhibit the best; but before and deeper than this was a hearty interest in every form of cultivation of mother Earth. From my earliest acquaintance with Mr. Wilder, more than thirty years since, I recall a reverent appreciation of the wisdom and goodness of the Creator in all his material works. And I think as the years went by a steady and a marked increase of this feeling was to be noticed—a leading from Nature up to Nature's God, so that he gave frequent expression of his gratitude to the Infinite Ruler of the Universe.

After his severe prostration, more than a score of years ago, which compelled his retirement from active commercial enterprise, it was remarkable with what new zest he entered upon horticultural pursuits. He did not consider himself too old to sow seeds of trees, to cross-fertilize flowers that he might obtain seeds for new varieties, to form and lead off new societies which might exert a perpetual influence. His interest in this Society was never more active than in the last days of his life. And while often alluding to the vast changes which had been accomplished in the modes of culture and the improvements in varieties, how hopefully did he look forward to the progress yet to be made! With what youthful vigor did he anticipate the results to be obtained by hybridization!

We shall love to recall the picture of this patriarch as he walked among his plants, watching to obtain some new results and improvements by crossing and varied culture. It seemed as though this occupation was to him the very elixir of life, imparting to him a

perennial youth. How different in its result from a life spent in the absorbing and selfish pursuit of gain or worldly ambition! And yet in other respects Mr. Wilder was an old man, his life was completed — his was a sublime old age, full of good works. The world is better, how much better! for his living in it. Long shall we cherish his memory; long may we be stimulated by his example.

Rev. A. B. Muzzey read the following memorial, prepared by him:

A connection in this Society of forty-two years with Marshall P. Wilder, all filled with the highest respect, and many of them with a friendship based on personal intimacy (treading, as we did, alike through more than one path darkened by some of the deepest shadows of home) demands, I feel, from myself, in these memorial services, some notice of the traits of his remarkable character. His prolonged life was too active, too earnest and influential, to receive only an ordinary brief and superficial record. The son of a farmer, he inherited a taste for cultivating the soil, and was diverted from that pursuit only by a casual incident that led him into a mercantile life. But this never stifled or decreased that early love of nature which made him eventually so distinguished in horticulture. His passion for flowers and fruits impelled him to devote himself more and more, by importing new and rare plants, and especially through hybridization, to the production of the choicest specimens in these departments.

A constant contributor to our exhibitions, he secured numerous premiums, both for flowers and fruits, on to the very last month of his long life. Nor were these testimonials confined to this Society. He received from the United States Agricultural Society a present in silver which he tenderly bequeathed to his daughters, down to the last survivor of them, "to have and to hold, to her, her heirs, executors, administrators, and assigns, absolutely."

A thoroughly practical gardener, he united with this art a steady and deep thoughtfulness which made him a man of science. He had a progressive mind, never satisfied with present achievements. A steady observer of nature, he kept up with the times, ready for new ideas, ready for everything that promised better results in the garden. And so in agriculture; a member of our State Board of Agriculture, he was essentially the founder of the Massachusetts

Agricultural College, and prominent in its support, being at his death one of its Trustees and senior member of its corporation. His broad mind led him also to take an interest in the mechanic arts; and to the last he was a Trustee of the Massachusetts Institute of Technology. A born commander, he naturally and almost by common consent was placed at the head of the associations he joined or into which he was chosen. When elected to the Massachusetts Senate he was at once designated as its president.

Mr. Wilder was no less remarkable as an organizer than in his work as an individual. To him the country owes the inception and establishment of the American Pomological Society. From the beginning on he has been its President; and his annual addresses are full of records of the past and suggestions for the future, which have diffused an interest in the production of the best fruits throughout the length and breadth of our land.

And, if as an organizer, no less as a presiding officer he had rare endowments. With a large intelligence, comprehending each subject that came up for consideration, he united a ready utterance, a happy command of language, a quick recognition of each speaker, and that perfect self-possession essential to the chair. Impartial and courteous to everyone, and by his prompt memory recalling names, dates, and events with marvellous facility, he commanded the attention of all present and caused a helpful and gratifying dispatch of business. The silver testimonial presented to him by our Society, at the close of his eight years' service as President, was a token of esteem as truly deserved as it was prized by the recipient.

And alike on the floor as in the chair, and as a debater, his success was noteworthy. Gifted with a good voice, his distinct enunciation, fluent expression, and accuracy of statement, embodying his clear and logical thought and not deficient imagination — all set forth in a pleasing spirit — made his words often eloquent and always welcome.

Nor did Mr. Wilder come short of equal success as a writer. Whenever he took up his pen, he had something worthy of its use. And his ideas were usually fresh, to the point before him, and often original. And for style, this well-nigh self-taught man, by his nervous, simple, direct, clear mode of expression, was a model to many who boast of what is termed a liberal education. The twenty annual addresses written by him as President of the New

England Historic Genealogical Society, for their variety of topic, their comprehensive pictures of the passing years and events, and their just historic and biographical delineations, deserve high commendation.

Besides his distinctions in our own country we should recall the honors he received and his appreciation abroad. He was made honorary member of the Royal Historical Society, and corresponding member of the Royal Horticultural Society, in London; and a fellow of the Reale Academia Araldica Italiana, of Pisa.

If, as we are proud to say, the Massachusetts Horticultural Society is known and honored in Europe, to Mr. Wilder, not forgetting the claims of many others in our association, this gratifying circumstance must be largely ascribed. The tidings of his death will be a grief to the foreign friends of this institution.

I cannot close without adverting to the high position of Mr. Wilder in private and social life. It was a privilege to meet him in the varied clubs and other associations which he favored with his presence. There we saw not only the breadth of his character, his sober and solid worth, but his genial temper. No one knew him thoroughly as a man who had not sat down with him at the table in the day of his health and strength; when he would unbend, lay aside each "carking care," and give way to that wit and humor which lay imbedded in his rich, affectionate, and fertile spirit. To be a friend of Mr. Wilder was indeed an enviable lot. Said one to me a few days since: "We all rejoiced to see him at the dinners of our Board of Trade."

Who, that ever received from him in these latter days one of his tender notes signed "your old friend," can restrain a tear as he thinks of those tremulous lines and reflects that we shall see his face and enjoy the warm pressure of his hand no more? This manliest of men, so robust in his prime, had the heart of a child. Let us lay our blossom on that large and sincere gathering of the flowers he so loved, and let our sorrow be turned into joy when we can do our part, however small, to swell the tribute so widely and so gladly paid to our departed friend and brother.

Charles M. Hovey said that as one of the Committee to prepare a memorial of Mr. Wilder, he took great comfort in seconding that prepared by the Chairman. The Society had lost a friend, but he had lost one of his oldest friends. He recalled the day when he became acquainted with him and associated with

other members of the Society. As a young man he felt something of awe towards them, but he singled out Mr. Wilder and formed an intimate friendship with him. It soon became a custom with him in winter frequently to ride out to Dorchester with Mr. Wilder when he went home at night, and in the evening they would go out to the greenhouse, each with a candle in his hand, and examine the camellias, with their glistening foliage, and on returning to the house they would look over the books on horticulture which Mr. Wilder then possessed. At the close of the evening Mr. Wilder would send him down to the Norfolk House in his carriage, to take the omnibus for Boston on his way home to Cambridge. When, in 1833, the speaker projected the "Magazine of Horticulture," his first thought was of Mr. Wilder, and he asked him to write a paper on the camellia. This he did, extending it through several numbers of the magazine, and it was the first thing he ever wrote on horticulture. The camellia was then hardly known here except to Mr. Wilder and the speaker. "You can judge from this," said Mr. Hovey, "how much of a friend I have lost."

Their association on the Flower, Library, and other Committees, was early and long continued, but circumstances changed, and with growing families to bring up their visits to each other necessarily became less frequent.

Mr. Wilder was one of those men whose magnetism was such that you could not but do what he wanted you to do. Thus the speaker accompanied him to the fair of the United States Agricultural Society at Philadelphia, and made an exhibition of fruit there. This enthusiasm was the key-note of his success. Mr. Hovey closed by expressing his trust that the fund which Mr. Wilder had left to the Society would be the means of perpetuating his memory long after those who knew him personally should have passed away.

Benjamin G. Smith said that Mr. Wilder was his beau ideal of a a man. No name of this century is written more imperishably in the affection and esteem of Boston and Massachusetts than that of Marshall P. Wilder.

John C. Hovey spoke of the long letter which he received from Mr. Wilder, after the death of his father, full of the kindest expressions of sympathy. Though in one sense he was an old man, in others he was still young. He kept up his interest in the cultivation of flowers to the last, as was evinced by the inquiries he made of the speaker in regard to its details.

John G. Barker said that whoever enjoyed Mr. Wilder's friendship had a whole friend. For the last few months, since he had been Superintendent of Forest Hills Cemetery, their relations had been of the tenderest nature. He frequently visited the cemetery, and gave him most interesting reminiscences of those buried there, and said it would not be long before the speaker would have to care for him all the time; and a short time ago, as the evening shades were falling, he was laid away, leaving only pleasant remembrances.

O. B. Hadwen esteemed it a privilege to add a word to what had been said. In one sense Mr. Wilder was the father of this Society; his handwriting is inscribed on these walls. But he was the leader in establishing other societies, and as a member of the State Board of Agriculture, a trustee of the Agricultural College, and in other organizations, his record is unequalled in this generation, and will go down to generations to come.

Robert Manning said that it would be expected of one so long and intimately associated with Mr. Wilder as he had been, to say a few words. He recalled the time when he made the acquaintance of Mr. Wilder. When a mere boy he was sent with his brother, during the last illness of his father, with fruit for one of the exhibitions of this Society, of which Mr. Wilder was then President, and they were introduced to him. But Mr. Wilder had been a friend of his father's and his name had been a household word since his earliest recollection. With the late Hon. Benjamin V. French and Hon. Samuel Walker he seemed to form a trinity of horticulturists who, more than any other men, represented the Society in his mind before he became actively associated with them; and he was glad that one of them had been spared to us so long. He had hoped that Mr. Wilder might live to the meeting of his favorite society, the American Pomological Society, in this city in September next, but it had been differently and, we could not doubt, more wisely ordered. Mr. Wilder himself felt deeply the uncertainty of his stay until that time, for in the address which he prepared for the meeting at Grand Rapids, Mich., in September, 1885, after expressing his regret that he was unable to be there personally, he said in words that now seem prophetic, "I console myself with the hope that you will accept the invitation of the Massachusetts Horticultural Society and come to Boston in 1887, when I may be permitted to lay off the robes of office with which

you have so long honored me, unless ere that time I shall have been clothed with the robes of immortality, and gone up to gather celestial fruits, which ripen not in earthly climes."

One of Mr. Wilder's most prominent characteristics was the perpetual youth which, in spite of the infirmities of age, he carried with him, and which led Governor Long, in his speech at the meeting of the American Pomological Society in this city in 1881, to speak of him as at once the oldest and the youngest man in the State. This had been attributed to his love for rural pursuits; but the speaker thought it due rather to his kind and loving heart, continually overflowing with regard to everyone, so that they who had known him but a short time felt that in his death they had lost a dear friend. This thought, the speaker said, had been better expressed in Whittier's lines, with which he closed:

"To homely joys and loves and friendships
Thy genial nature fondly clung;
And so the shadow on the dial
Ran back and left thee always young.

* * * * * *

Thy greeting smile was pledge and prelude
Of generous deeds and kindly words;
In thy large heart were fair guest-chambers
Open to sunrise and the birds.

* * * * * *

O friend! if thought and sense avail not
To know thee henceforth as thou art,
That all is well with thee forever
I trust the instincts of my heart.

Thine be the quiet habitations,
Thine the green pastures, blossom-sown,
And smiles of saintly recognition
As sweet and tender as thy own.

Thou com'st not from the hush and shadow
To meet us; but to thee we come.
With thee we never can be strangers,
And where thou art must still be home!"

The President, in putting the question on the adoption of the memorial, requested that it be done by a rising vote, in loving and respectful assent, which was unanimously complied with.

O. B. Hadwen, Chairman of the Committee on Publication and Discussion, read the annual report of that Committee, which was accepted. Mr. Hadwen further gave notice that the programme of meetings for the discussion of horticultural subjects was ready.

The following appropriations, previously recommended by the Executive Committee, came up for final action and were unanimously voted, viz.:—

For Prizes and Gratuities, ...	$6,000
Additional for Fruits, on account of the meeting of the American Pomological Society, . .	500
Additional for the Flower Committee, . .	300
Additional for the Flower Committee, . .	154
	6,954
For the Library Committee, for the purchase of magazines and newspapers, binding of books, and incidental expenses of the Committee, .	300
For the same Committee, to continue the Card Catalogue of Plates, ...	100
For the Committee on Publication and Discussion, ...	250
For the Committee of Arrangements — this sum to cover all extraordinary expenses of said Committee, ...	300
For the same Committee, to cover the deficiency in the appropriations for the years 1884 and 1885, ...	94.80

The President, as Chairman of the Executive Committee, reported that that Committee had appointed George W. Fowle Treasurer of the Society and Superintendent of the Building, and Robert Manning Secretary and Librarian for the year 1887.

On motion of E. H. Hitchings it was voted to amend the vote passed on the 11th of December, 1886, concerning the award of the Society's Silver Medal to George E. Davenport, so as to provide for the award of the Appleton Gold Medal.

It was voted that in compliance with the laws of the Commonwealth relating to agricultural societies a prize of $10 be offered

for the best Plantation of Trees for Ship Timber for the year 1887.

On motion of William H. Spooner, it was voted that the Executive Committee consider the subject of employing experts to award the prizes at some of the larger shows of the Society.

On motion of Edward L. Beard, it was voted that the Executive Committee report the most feasible method of limiting the number of annual members of the Society.

Francis H. Appleton moved that a committee of five be appointed to nominate a candidate to fill the vacancy in the Executive Committee caused by the death of Hon. Marshall P. Wilder. The motion was carried and the Chair appointed as that Committee Mr. Appleton, Warren Heustis, Benjamin G. Smith, William H. Hunt, and E. H. Hitchings.

Mrs. P. D. Richards, of West Medford,

having been recommended by the Executive Committee as a member of the Society, was on ballot duly elected.

Adjourned to Saturday, January 8.

Biographical Sketch of Hon. Marshall P. Wilder.

The Committee on Publication have thought it best to insert here a short biographical sketch of Mr. Wilder, which has accordingly been prepared by the Secretary of the Society. Several such sketches were published during Mr. Wilder's life, some of which, especially that in the "Biographical Encyclopedia of Massachusetts in the Nineteenth Century," have been used in the preparation of the following memoir. The address of his pastor at the funeral has also afforded assistance. The portrait of Mr. Wilder prefixed to this volume was contributed by his family. It was engraved in 1872.

Marshall Pinckney Wilder was born in Rindge, New Hampshire, on the 22d of September, 1798. His Christian names were given in remembrance of Chief Justice John Marshall and General Charles Cotesworth Pinckney, both prominent Federalists at the time of his birth. His father, Samuel Locke Wilder, was a nephew of Samuel Locke, D.D., President of Harvard College; he held several important offices in the town of Rindge, and was also a

Representative in the Legislature of New Hampshire for thirteen years. His mother (Anna Sherwin) was the daughter of Jonathan Sherwin of Rindge, grandfather of Thomas Sherwin, Principal of the Boston High School for more than thirty years. The father was of Puritan origin and Puritan principles, and was a member of the Congregational Church in Rindge. The mother was endeared to her family and friends by deep piety and great moral worth. She was a warm admirer of the beauties of nature and doubtless transmitted religious and æsthetic instincts to her eldest son.

Young Wilder was sent to school at the age of four years, and at twelve he entered New Ipswich Academy. His father desired to give him a thorough collegiate education, and thus to prepare him for professional life. But at sixteen, after he had studied awhile with the village pastor, having the choice between agricultural, mercantile, and professional life, he chose to be a farmer. His father carried on a farm in connection with a country store, and the business of the latter increasing Marshall was taken into the store, beginning at the lowest round to ascend the mercantile ladder; but he soon acquired such habits of industry and such mastery of detail that he was admitted to partnership as soon as he had attained his majority.

The country town did not afford sufficient scope for his energies, and in 1825 he sought and found a larger field in Boston. He conducted a wholesale business in West India goods in Union Street, under the firm name of Wilder & Payson; next in the firm of Wilder & Smith in North Market Street, and afterward in his own name at No. 3 Central Wharf.

In 1837 he became a partner in the dry goods commission house of Parker, Blanchard, & Wilder, in Water Street; the style being afterwards changed to Parker, Wilder, & Parker, and the location to Pearl Street. Still later it was changed to Parker, Wilder, & Co., in Winthrop Square, where the firm was burned out in the great fire of November 9, 1872. They soon however resumed business, and through all the checkered fortunes of mercantile life, and in all the commercial crises of the last half century, Mr. Wilder never failed to meet his pecuniary obligations. At the time when he left the grocery business that of selling domestic dry goods on commission was a new one, the senior partner in the new firm, Mr. Isaac Parker, having sold the first bale of these

goods ever sold on commission in Boston; and Mr. Wilder lived to be the oldest merchant in the city in that line of business. His business success made possible all his wider labors for the good of the community.

At the time of his removal to Boston Mr. Wilder was a husband and a father, having in 1820 married Tryphosa, daughter of Dr. Stephen Jewett, of Rindge, a lady of great personal attractions. She died, July 31, 1831, while on a visit to her native town, leaving four children. On the 29th of August, 1833, he was united in marriage to Abigail, daughter of Captain David Baker, of Franklin, Mass., a lady of education, accomplishments, and piety. She died of consumption at Aiken, S. C., April 4, 1854, leaving five children. His third marriage, on the 18th of September, 1855, was to Julia, the sister of his second wife, a lady admirably qualified to console him and diffuse cheerfulness through his dwelling, by whom he had two sons. Of his whole family of fourteen children only five survive him. No man ever possessed stronger affections, and notwithstanding his many bereavements no man has been more blessed in domestic life or has enjoyed a brighter and happier home.

Mr. Wilder's horticultural tastes were no doubt largely inherited from his mother. In reply to an inquiry made of him during the last year of his life, he said that his earliest recollections of any interest in fruit culture were when he assisted his mother in the care of the garden in New Hampshire. There were then apple orchards in the town, but he had seen only one pear tree, no other than a wild grape vine, only the common red currant, the wild strawberry and red raspberry, a purple plum, some small red cherries, and peaches raised from stones brought from Massachusetts. The first fruit garden he ever saw was about seventy-five years ago — that of Gardiner Greene in what is now Pemberton Square, where the new Court House is now erecting. Here he imbibed inspirations which followed him through life.

Mr. Wilder was elected a member of the Massachusetts Horticultural Society on the 26th of June, 1830. At that time Gen. H. A. S. Dearborn was President of the Society, and Mr. Wilder soon became intimately associated with him, the Hon. John Lowell, and other leading members, and as long as he lived was one of the strongest and most judicious supporters of the Society. The sudden death of his first wife led him to seek

the retirement of the country, where he could gratify his taste for rural life. In June, 1832, he purchased the residence of Governor Increase Sumner, known as "Hawthorn Grove," on the corner of Washington and Columbia streets, in Dorchester, and there, after having given a suitable time to business in the middle of the day, he devoted all his leisure hours to the various branches of horticulture.

His zeal and energy were soon manifested at the exhibitions of this Society. His first contribution was a dish of Madeleine pears, on the 3d of August, 1833. Probably these, as well as Windsor, Double Eyed, and Catherine pears, and Green Gage and Prince's Imperial plums, a few weeks later, were from trees planted by Governor Sumner; but his contributions also included new flowers, which were doubtless of his own planting. On the 10th of August he contributed two new French Roses; and on the 12th of October Dahlias, Asters, Chrysanthemums, Papavers, and Marigolds — all in variety, besides a long list of other flowers. March 1, 1834, he made his first exhibition of Camellias, comprising six varieties; and a week later had eight varieties, besides other flowers. July 24 he showed new dahlias, carnations, and *Eschscholtzia Californica flore pleno;* the last "a new and very beautiful production, which very justly excited the admiration of all visitors present on account of its being produced double by Col. Wilder." August 9 he had a variety of flowers including *Lobelia cardinalis*, *L. splendens*, and *L. fulgens*. August 30 he had eleven new Dahlias besides other flowers, and on the 13th of September more new dahlias. At the Annual Exhibition in Faneuil Hall (the previous annual shows had been confined to the dining hall where the anniversary was celebrated) he was one of the largest contributors, especially of dahlias and greenhouse plants. Such were the beginnings of his contributions to the object lessons in horticulture which this Society has so long set before the people, and these contributions went on increasing in quantity and value, extending over a period of fifty-four years, and ceasing only with his life, the last having been at the Chrysanthemum Show in 1886 — little more than a month before his departure from among us.

On the 24th of October, 1835, some special awards were made by the Horticultural Society to several gentlemen who had been preëminent in forwarding the objects of the Society. These testimonials consisted of pieces of plate of the value of fifty dollars

each, suitably inscribed, one of which was given to Mr. Wilder for "beautiful exhibitions of Camellias, Roses, and Dahlias, embracing many new varieties imported by him from Europe;" showing that he was already recognized as a leader in horticulture.

July 2, 1836, Mr. Wilder exhibited fine specimens of *Gladiolus floribundus*, and June 24, 1837, a plant of *Oncidium flexuosum* which had at one time ninety-seven fully expanded flowers. This was the first orchid reported at any exhibition. At a Geranium Show on the 28th of April, 1838, the best display was made by him. At the Annual Exhibition that year he had a magnificent *Stanhopea quadricornis*. At this time the taste for the Camellia was universal and the collections were numerous, comprising every choice variety of native or foreign origin. That of Mr. Wilder stood first, there having been added to it within a year twenty-one of the newest varieties from China, England, Germany, Belgium, and Italy. *Rhododendron arboreum* in his collection exhibited nearly one hundred flower buds. Among the rare and curious tropical orchids which had been introduced, a dozen or more species might be found at Mr. Wilder's. Of these *Stanhopea insignis*, a rare and curious species, produced a superb inflorescence exciting universal admiration.

The Dahlia was at this time the favorite autumnal flower, and very extensive exhibitions were held, to which Mr. Wilder was one of the largest contributors. His displays in the autumn of 1839 at the Annual Exhibition of this Society, and at a Special Dahlia Exhibition in the Conservatory in the Public Garden, were so brilliant that some of the admirers of this gorgeous flower presented him with a silver vase, bearing an appropriate inscription and the motto "*Consequitur quodcunque petit*," to testify the pleasure they had received, in common with thousands of their fellow-citizens for several years, from these displays. A Special Grand Dahlia Show was held on the 23d of September, 1840, continuing four days. Nearly three thousand superb blooms were displayed on this occasion; besides asters and other annuals. A Premier Prize for the best six dissimilar blooms and a prize for the best specimen bloom were both taken by Mr. Wilder. The other prizes were in two divisions; the first open to cultivators of more, and the second to cultivators of less, than two hundred plants. Of course Mr. Wilder was in the first division; the highest prizes were two for the best twenty-four dissimilar blooms, of which he took the first.

On the 19th of June, 1841, Mr. Wilder exhibited *Clematis azurea grandiflora*, a fine new kind. On the 7th of August, the High Bush Blackberry (now known as the Dorchester) was exhibited by Eliphalet Thayer of the town from which it took its name. This was the first of the improved varieties of blackberry. That afternoon Mr. Wilder went with his friend, Cheever Newhall of Dorchester, to see the blackberries growing in Mr. Thayer's garden, and he was afterwards instrumental in disseminating it. The next week he exhibited the first of the Japan Lilies, now so extensively cultivated. It was the *Lilium lancifolium album;* the plant having two flower spikes on which were eight expanded flowers and ten buds, and being in the estimation of the Committee "a superb plant." It was not discovered until about ten years later that these lilies are hardy in this climate.

At that time in all parts of Europe and America new varieties of fruits, plants, and trees were continually brought into existence by the hand of the skilful gardener. The vanity or the ignorance of the originators of many of these new varieties led them to overrate their value. Differences of soil and climate also render such productions, which may be of the greatest value in one country, of less in another. It is of the highest importance that these accumulations should be tested in regard to their intrinsic value and their adaptation to our soil. This work Mr. Wilder set himself to perform, so far as he might, for his own gratification and for the benefit of the community. Especially had the pomologists of Belgium and other European countries been busy in producing from seed new varieties of the pear, and the desire on the part of several cultivators near Boston to test these new varieties was so great that it was described by A. J. Downing as a "pear mania." Here again Mr. Wilder's zeal and energy were exerted until the pear, in his orchard of twenty-five hundred trees and eight hundred varieties, became as noted as the camellia in his conservatory. At the exhibition of the American Pomological Society in this city in 1873, he placed on the tables 404 varieties of pears. Of this fruit alone he tested over 1200 varieties, while grapes, cherries, plums and small fruits were tested on such smaller scale as was appropriate. Among the magnificent prizes which were the results of these untiring labors was the Anjou pear, so widely renowned at the present time, which was first shown by Mr. Wilder, at the Annual Exhibition in 1844. He continued to intro-

duce new pears after others had ceased, exhibiting the Souvenir du Congrès and the Assomption in 1873. The *Weigela rosea* was exhibited by his gardener in full bloom on the 19th of April, 1851, and was described as an "exquisite hardy shrub." At the Annual Exhibition in 1854, Mr. Wilder showed a finely grown specimen of *Cissus discolor*, interesting not only for its rare beauty but as the harbinger of the infinite variety of ornamental leaved plants now so generally cultivated and admired. In 1874 he exhibited the hardy and valuable *Azalea mollis*. The last year of his life he took prizes at the Annual Exhibition of this Society for Pears and native Grapes, and for Chrysanthemums at the Chrysanthemum Show, and at the exhibition of the Bay State Agricultural Society he placed on the tables a hundred varieties of Pears and twenty of native Grapes.

We might go on with multiplied instances of fruits and flowers introduced to our gardens by Mr. Wilder's zeal, but those mentioned must serve as specimens. He did not, however, content himself with introducing the productions of others, but diligently endeavored to produce improved fruits and flowers in his own houses and grounds. His first attempt was with his favorite flower, the Camellia, and resulted in producing, among others, those two fine varieties, Camellia Wilderi and C. Mrs. Abby Wilder. These were first exhibited before the Society on the 15th of February, 1846. It may be of interest to mention that the original plant of C. Wilderi and all the stock, except a single graft, were destroyed by a fire in Mr. Wilder's greenhouse on the 16th of April, 1841. The graft was remote from the hottest part of the house and further protected by a sort of bell-glass, so that the variety was fortunately saved. Over five hundred seedling camellias in varioue stages of growth were destroyed by this fire. Camellia Mrs. Abby Wilder has produced curious sports, which have been made into permanent varieties by "fixing the graft." One of these, Camellia Grace Sherwin Wilder, is known in England as the Queen of Beauty.

As soon as he had introduced the Japan Lilies he commenced hybridizing them, and in 1846 exhibited seedlings from them. May 12, 1848, he exhibited a fine seedling rhododendron, a hybrid between *R. campanulatum* and *R. Catawbiense*. The seedling strawberry which bears his name — a cross between the Hovey and La Constante — is well known as of the finest quality. Of

the many seedling pears raised by him perhaps the best is that named for his son, Eddie Wilder. At the meeting of the Society on the 10th of March, 1883, he exhibited two Chinese Azaleas in flower at two years from seed. Many who knew him in recent years will remember the camel's hair pencil which he always carried in his pocket to transfer the pollen in cross-fertilizing. As in other departments of horticulture, his labors in this branch ceased only with his life; at the Strawberry Show in 1886 he presented two seedling varieties, the Dorchester and Omega, which gave promise of much value as late varieties. And now that he has gone we remember his earnest exhortations, particularly in his addresses before the American Pomological Society, to produce improved varieties of fruit from seed, and especially to cross well chosen varieties with that purpose. Among his many horticultural experiments those made to determine the best method of ripening and preserving fruit should not be omitted. For this purpose he built several fruit houses, on different principles. Besides his original researches, he availed himself of the wisdom of others and collected a valuable library of horticultural and agricultural books, and also books on history and other subjects in which he was interested.

Mr. Wilder's services to the Horticultural Society extended beyond the support of its exhibitions by contributing to them the newest and choicest products of his garden and greenhouses. His executive ability and business tact were freely given to aid in the administration of its affairs. A most important service was rendered to it by him when, on the 6th of December, 1834, he made a motion "That a committee be appointed to consider the expediency of disposing of the interest of the Society in the Garden and Cemetery of Mount Auburn to the proprietors of lots in the Cemetery, and report the conditions on which a conveyance shall be made if the committee deem the measure advisable;" and as a member of the committee appointed in pursuance of this vote succeeded, by his conciliatory efforts, after several exciting meetings had been held, in effecting an arrangement which has proved of the greatest benefit to the Society; giving it a financial standing above that of any other horticultural society in the world. He felt that the position occupied by him was fraught with great difficulties, for though then a comparatively young man he was placed in opposition to Judge Story, the Chairman of the Com-

mittee; whose sympathies were wholly with the proprietors of lots. When the report of the Committee was adopted by the Society Mr. Wilder was Chairman of the Committee appointed to carry it into effect; and when in 1858 Dr. Bigelow, then President of the Proprietors of Mount Auburn, desired a conference with the Horticultural Society while some of those who had been acquainted with the subject from the beginning were still living, to adjust amicably certain differences that had gradually arisen, Mr. Wilder was one of the Committee on the part of the Society. The marble bust of Mr. Wilder by Henry Dexter, presented to the Society by Charles O. Whitmore, March 31, 1863, was intended by the donor to commemorate Mr. Wilder's services to the Society, and particularly those in connection with Mount Auburn.

Mr. Wilder was Vice-President of the Society in 1839 and 1840; and President from 1841 to 1848, holding that office longer than any other who has filled it. Great energy, unwearied perseverance, and much skill and tact are necessary in the executive officers of such a society to maintain its influence, meet its large expenses, and justify the public expectation in regard to it. All these qualities were singularly united in him. Soon after becoming President he commenced the measures which resulted in the erection of Horticultural Hall on School street, believed to be the first building ever erected by a horticultural society for its own use. The corner stone was laid by Mr. Wilder, who delivered an appropriate address, on the 14th of September, 1844; and the building was dedicated on the 15th of May, 1845. He was also a member of the Building Committee of the present Horticultural Hall.

It was during Mr. Wilder's presidency, in 1842, 1845, and 1848 that the Triennial Festivals of the Society were held. No more brilliant *fêtes* than these had ever been held in Boston, and those who knew Mr. Wilder in his later years will remember how he loved to recall that in 1845 the festival (in Faneuil Hall) was attended by Hon. Edward Everett, who had that morning arrived in Boston after a five years' residence as minister of the United States at the court of St. James; Hon. Caleb Cushing, who had just returned from his embassy to China; and many other distinguished guests, including Hon. Daniel Webster, who asked permission of the President to introduce to the assembly the venerable widow of Alexander Hamilton, the daughter of Gen.

Philip Schuyler, who sat on the right hand of the President. An engraved representation of the festival in 1848 (also at Faneuil Hall) was published in the "Horticulturist" for November of that year, and copied into the "Flore des Serres."

It was also during Mr. Wilder's presidency that the imperial octavo TRANSACTIONS of the Society, with colored plates of fruits and flowers by the best artists, were published, much in the style of the "Transactions of the London Horticultural Society," from which the idea was doubtless taken. Three numbers were published, making one volume.

On the 28th of July, 1848, after a correspondence with other societies in regard to the expediency of holding a national convention of fruit growers, Mr. Wilder, as Chairman of a Committee of the Massachusetts Horticultural Society, in connection with similar committees of the Pennsylvania, New Jersey, and New Haven Horticultural Societies and the Board of Agriculture of the American Institute of the City of New York, headed a call for such a convention, which accordingly met on the 10th of October, in New York. This measure proved to be of an importance not anticipated at that time; for this American Congress of Fruit Growers, as it was styled, consolidated in 1849 with the North American Pomological Convention which held its first meeting at Buffalo, N. Y., September 1, 1848, (the united societies being known as the American Pomological Congress) has effected more for the advancement of pomology than any other association in the world; and its publications have become a standard authority on the subject. On the organization of the American Congress of Fruit Growers Mr. Wilder was chosen President, and with the exception of one year, when owing to a death in his family he was unable to be present at the meeting, held the office of President of the American Pomological Society (the name adopted in 1852) until his death. This was perhaps the best loved by him of all the many associations with which he was connected. The addresses which the By-Laws of the Society require the President to deliver at the biennial sessions were punctually prepared by him and form a series of great interest.

On Mr. Wilder's retirement from the Presidency of the Horticultural Society at the close of the year 1848 he was presented with a silver pitcher and salver of the value of one hundred and fifty dollars, as a testimonial of the appreciation by the Society of his services

as President. But his interest in the management of the Society did not cease with that event. By virtue of the office of President he had been Chairman of the Executive Committee from 1841 to 1848, and he continued to be a member, either as an Ex-President or by election, until his death, and no one was more constant and punctual in attending its meetings than he. He was a member of the Committee on Flowers in 1837 and 1838; a member of the Committee on the Library in 1838, 1839, and 1840, and Chairman in 1842; Chairman of the Committee on the Synonymes of Fruits from 1844 to 1865; Chairman of the Finance Committee from 1849 to 1858, and with the exception of one year a member from that time until 1866. He was also frequently appointed on important special committees. By his will he bequeathed to the Society, as a fund to perpetuate his memory, the sum of one thousand dollars; the income of which is to be awarded in prizes for the improvement of the Pear and the Grape.

Mr. Wilder's interest in agriculture and labors to promote its improvement were hardly less than those in horticulture. The first organized effort in which he joined in this behalf was on the first Saturday in April, 1840, when several gentlemen who felt that nothing is so conducive to right thinking as good eating and drinking met at the Exchange Coffee House to form a club to dine together monthly for conversation and the interchange of opinions relating mainly to agriculture. This association was named the Massachusetts Agricultural Club, and its meetings have been held regularly until the present time. The first President was Cheever Newhall, who continued in that position until his death in 1878, when he was succeeded by Mr. Wilder, whose incumbency also was terminated only with his life. It was around this social board that many of the projects for the advancement of agriculture in which Mr. Wilder took a leading part were discussed and brought into shape. The first of these was the Norfolk Agricultural Society, formed in February, 1849, when he was chosen President. In his first address before this Society he urged the importance of agricultural education — the first general effort for the promotion of this interest in our country. Governor Briggs, Lieutenant Governor Reed, Daniel Webster, Edward Everett, Robert C. Winthrop, Ex-Governor Lincoln of Massachusetts, Ex-Governor Hill of New Hampshire, Charles Francis Adams, Josiah Quincy, Sr., Josiah Quincy, Jr., Gen. H. A. S.

Dearborn, Horace Mann, and many others of national reputation were among his hearers. This effort ultimately bore fruit in the Massachusetts Agricultural College. He was President of this Society for twenty years and on his retirement was constituted Honorary President in acknowledgment of his services. In February, 1886, Henry O. Hildreth, for many years Secretary of the Norfolk Agricultural Society, presented a complete set of the "Transactions" of that Society to the library of the Massachusetts Horticultural Society, in memory of Mr. Wilder's twenty years' presidency.

The next of Mr. Wilder's plans for the promotion of agriculriculture was the establishment of the Massachusetts Board of Agriculture. A large meeting of delegates was held in response to an invitation from him as President of the Norfolk Agricultural Society and from other agricultural societies in the State; the Massachusetts Central Board of Agriculture was organized; he was elected President, and retained that office until the Board of Agriculture became a department of the State government. Up to the time of his death he was the senior member of the Board.

In 1852, under the auspices of the Massachusetts Board of Agriculture, he prepared a circular calling a national convention of agriculturists at Washington. A meeting was held in that city on the 24th of June, 1852, in which twenty-three States were represented by one hundred and fifty delegates. The United States Agricultural Society was organized, and Mr. Wilder was chosen President. He held this office for six years, and on his resignation a silver tea service of the value of two hundred and fifty dollars was presented to him. At the next annual meeting the large gold medal of honor, valued at one hundred and fifty dollars, and bearing the inscription, "Awarded to the Hon. Marshall P. Wilder, Founder, First President, and Constant Patron," was unanimously conferred upon him. This medal he bequeathed to the Massachusetts Horticultural Society. Much was done by the United States Agricultural Society through its meetings, publications, and exhibitions of horses and other live stock, implements, and farm products to improve the agriculture of our country, until the approach of the civil war put an end to its operations.

In 1858, as a result of Mr. Wilder's efforts in behalf of agricultural education, the Massachusetts School of Agriculture was incorporated, and he was elected President. It was intended to

locate the school at Springfield; but as Congress soon afterwards granted land to each State for an agricultural college the necessity for the school was obviated. In 1863 the Massachusetts Agricultural College was incorporated, and he was named as its first trustee. In 1871 he delivered the address on the graduation of the first class from that institution, and at the Commencement in 1878 he had the honor of conferring the degree of Bachelor of Science on twenty young gentlemen who were also its graduates.

Mr. Wilder's labors for the good of the community were not confined to his favorite pursuits of agriculture and horticulture. In 1859 he presided at the first public meeting in relation to the collocation of several scientific institutions on the Back Bay lands, where the splendid edifices of the Boston Society of Natural History and the Massachusetts Institute of Technology now stand. Of the latter institution he was one of the founders, a Vice-President, and Chairman of its Society of Arts.

In January, 1868, he was unanimously elected to the office of President of the New England Historic Genealogical Society, made vacant by the death of Ex-Governor John A. Andrew; which he held until the time of his own death. At each annual meeting he delivered an appropriate address. In his first address he urged the importance of procuring a suitable building for the Society, and in 1870 a Committee, of which he was Chairman, was appointed to carry out this object. Mr. Wilder devoted more than three months to the work of soliciting funds for this purpose, and raised more than forty-four thousand dollars, with which the building No. 18 Somerset street was purchased and adapted to the purposes of the Society. A little later he raised a fund the income of which is devoted to paying the librarian, and a year or two before his death a further sum for enlarging the building, making a total of nearly eighty-four thousand dollars, secured by him for promoting the objects of the Society.

Mr. Wilder was one of the twelve representative men selected to receive the Prince of Wales at the banquet given in his honor on the occasion of his visit to Boston in 1860. He was also one of the United States Commissioners to the Universal Exposition at Paris in 1867, where he was appointed Chairman of the Committee on Horticulture and the Cultivation and Products of the Vine. While in Europe he visited many of the prominent horticulturists in England, France, and Belgium whom he had previ-

ously known by correspondence; also examining the most noted gardens, and inquiring into the state of horticulture. From Europe he hastened home to preside at the meeting of the American Pomological Society at St. Louis, Missouri. Early in 1869, with a few horticultural friends he made a tour in the South in the hope of meeting the members of the Pomological Society in some of the Southern States whom he had not seen since the beginning of the civil war, but also with the view of ascertaining the resources of that part of our country and the state of horticulture there. An account of this tour was published by him in "Tilton's Journal of Horticulture." In 1870 with a larger party he made a journey to California, chiefly to examine the orchards, vineyards, and gardens, as well as the more important native trees and plants of that State. The results of the observations of these tourists were published in the "Rural New Yorker" and in "Tilton's Journal of Horticulture." They were also embodied in a lecture by Mr. Wilder which he delivered before several audiences.

In politics Mr. Wilder took comparatively little interest. Multitudes of other men stood ready to serve the State politically, but few could serve it as he has done in his chosen walks of usefulness. In 1839 he was induced to serve as a representative in the Legislature for the town of Dorchester during a single term. Ten years afterward he was elected a member of Governor Briggs's Council, and in the year following a member and also President of the State Senate, where he was active in promoting the cause of agricultural education. Once he stood on the brink of a public career, that would have robbed us of many a gracious service and would surely have invaded the order and peacefulness of his life. Whatever ambition he may have had for political advancement, in later years he felt that it was better that it had not been gratified, for he had served his fellow men more effectually and enjoyed life more than if it had been.

The military title of Mr. Wilder was due to his natural proclivity to military pursuits — probably a hereditary tendency. The earliest ancestor to whom the family has been traced was Nicholas Wilder, a chieftain in the army of the Earl of Richmond who fought and won the battle of Bosworth in 1485. Mr. Wilder's ancestors rendered meritorious services to their country in the Indian wars, in the Revolution, and in Shays's insurrection. The warm

blood and courageous daring of the old Puritan warriors, exhibited in many sanguinary encounters with dusky and lighter colored foes of the forest and sea-coast, had been transmitted to him. Opportunities for the display of hereditary qualities in actual warfare were wanting, but the pomp of preparation supplied the lack. At an early age he took a keen interest in military affairs, at sixteen was enrolled in the militia of New Hampshire, and at twenty-one was commissioned as Adjutant. He organized and equipped the Rindge Light Infantry, and was chosen its Captain. At twenty-five he was elected Lieutenant Colonel and at twenty-six was commissioned as Colonel of the Twelfth regiment. Soon after his removal to Boston he joined the Ancient and Honorable Artillery Company; and, after having been nominated four times and as frequently declining the honor, in 1857 he accepted the command.

This artillery corps is the only offspring of the Royal Artillery Company of London, founded in 1537 and commanded by the various sovereigns of England. Colonel Wilder entered into an interesting correspondence with Prince Albert, then in command, sending to him a copy of the history of the Boston Company, and receiving in return an elegant copy of Highmore's History of the Royal Artillery Company. At the two hundred and nineteenth anniversary, in 1857, Prince Albert was, on motion of Colonel Wilder, elected a special honorary member, and at the anniversary in 1878 the present Commander of the corps, the Prince of Wales, was, at the instance of Colonel Wilder, made a special honorary member as his father had been, twenty-one years before.

On the 7th of November, 1849, a festival of the Sons of New Hampshire was celebrated at Boston. The Hon. Daniel Webster presided and Mr. Wilder was Vice-President. The association again met on the 29th of October, 1852, to attend the funeral of Mr. Webster. On this occasion the Legislature and other citizens of New Hampshire were received at the Lowell depot and addressed by Mr. Wilder in behalf of the sons of that State resident in Boston. The "Sons" celebrated their second festival November 2, 1853. Mr. Wilder occupied the chair as President and delivered one of his most able and eloquent addresses. They assembled again June 20, 1861, to receive and welcome the New Hampshire regiment of volunteers; and escorted them to Music Hall, where Mr. Wilder addressed them in a patriotic speech appropriate to their departure for the field of battle.

The two hundred and twenty-fifth anniversary of the settlement of Dorchester was celebrated on the 14th of July, 1855. The orator of the day was Edward Everett. The central tablet of the great pavilion bore the inscription "Marshall P. Wilder, President of the Day. Blessed is he that turneth the waste places into a garden and maketh the wilderness to blossom as a rose."

Mr. Wilder was a member of many horticultural and agricultural societies in this and foreign lands. He was elected a corresponding member of the Royal Horticultural Society of London; a corresponding member of the Société Nationale d' Horticulture de France, at Paris; an honorary member of the Société Centrale d' Horticulture du Département de la Seine-Inférieure, at Rouen; a corresponding member of the Society for the Promotion of the Useful Arts and Auxiliary Sciences, at Frankfort on the Main; an honorary member of the Royal Historical Society of Great Britain; and an honorary member of the Royal Academy of Heraldry and Genealogy, at Pisa, Italy. In 1877 he received the degree of Ph. D. from Dartmouth College and in 1884 that of LL. D. from Roanoke College. Mr. Wilder's eightieth birthday was celebrated by a dinner given him at the Parker House, and on his eighty-fifth birthday a larger company met at the same place to testify their respect and love for him. An account of this celebration was published in book form. On his eighty-eighth (and last) birthday a similar gathering was held at "Taft's," at Point Shirley, at the invitation of Benjamin C. Clark, Secretary of the Massachusetts Agricultural Club, an occasion which will long be remembered by all who had the good fortune to be present.

Mr. Wilder received all the Masonic degrees, including the thirty-third, the highest and last honor of the Fraternity.

As a writer and public speaker Mr. Wilder was fluent, forcible, and popular. His published writings consist largely of agricultural, pomological, and historical addresses. On the 2d of March, 1878, he presented to the library of the Massachusetts Horticultural Society a handsomely bound volume of addresses and speeches relating to agriculture and horticulture, which form a most interesting memorial of him. Other similar memorials in the library have been already mentioned in this sketch. One of his most important literary productions was a sketch of "The Horticulture of Boston and Vicinity," prepared for the fourth volume of the "Boston Memorial Series," the materials of which

he collected and arranged when eighty-three years old. It was also published in pamphlet form, and a copy was presented by him to the library of the Horticultural Society.

But we must bring this brief memoir to a close, for if we were to pursue the subject and chronicle all Mr. Wilder's labors for the advancement of agriculture and horticulture, all the manifestations of confidence reposed in him in public and private relations, and all the honors bestowed upon him we should not have a page for other matter.

As might have been foreseen, Mr. Wilder died in the harness. Until within a short time no man enjoyed life more than he or clung to it more strongly, but after the death of his wife in November, 1885, he desired to depart and be with her. On Saturday the 4th of December, 1886, he attended the meeting of the Horticultural Society and afterwards presided at the dinner of the Agricultural Club. He was somewhat fatigued and during the next week a cold causing rheumatism confined him to his bed for a day or two. After this he improved, and on the morning of Wednesday, the 15th, the librarian of the New England Historic Genealogical Society called and talked with him about the annual address which Mr. Wilder was to deliver before that society the next month, and which he had already finished. The next morning he felt still better, rising at his usual hour and taking breakfast with the family. He transacted a little business with his son Edward, signed a letter, and talked cheerfully with the physician when he came. The doctor inquired in regard to his rheumatism and Mr. Wilder replied that it was all gone, then pressed his hand to his heart and in an instant was dead.

> "Thus with no fiery, throbbing pain,
> No cold gradations of decay,
> Death broke at once the vital chain,
> And freed his soul the nearest way."

The funeral was at the Second Congregational Church in Dorchester, on Sunday, the 19th of December, at 2 o'clock. Until within the last two or three years Mr. Wilder had been a regular attendant at this church, and in 1883 he presided at the seventy-fifth anniversary of its organization and delivered an address. For twenty-five years he was Chairman of its Board of Assessors, and for nearly half a century presided over meetings of various

kinds in connection with the parish. The central part of the house was reserved for the funeral party and for the representatives of the numerous organizations with which Mr. Wilder had been connected. Besides the Committee appointed by the Massachusetts Horticultural Society to attend the funeral other members were present, and the New England Historic Genealogical Society, the New England Mutual Life Insurance Company, the Hamilton National Bank, the Home Savings Bank, the Ancient and Honorable Artillery Company, the Massachusetts Institute of Technology, and the Masonic fraternity were represented. Almost every individual in the large assembly had known and loved him as a friend.

A private service was held at his residence, and at the close the casket was borne to the hearse by four men who had been in his employment for many years. At the church the exercises consisted of singing of some of his favorite hymns, reading of the Scriptures, prayer, and an appropriate and appreciative address by Rev. Edward N. Packard, pastor of the church. Besides the points which we have mentioned in this sketch, he spoke of Mr. Wilder's strong religious bent, inherited from a godly ancestry, and of his constant and generous support of the Gospel and of all good works to which the church lent her hand. In his horticultural pursuits he sought Nature and listened and watched for the footsteps of the benevolent Deity, walking still in the garden in the cool of the day.

The interment was in Mr. Wilder's lot at Forest Hills Cemetery, where his last two wives and several of his children had been buried.

The life of Mr. Wilder is a striking instance of what an individual may accomplish by industry, indomitable perseverance, and the concentration of his intellectual powers upon one great object. With him, it was that of raising the standard of terraculture to a higher rank among the great pursuits of a nation. No ordinary talent, no turn of mere good fortune, could ever have placed him in the high position he attained as a public benefactor. But back of all his mental endowments he had a strong constitution and sound physical health, the foundation of which was doubtless laid while working on the New Hampshire farm. Without these he never could have performed such labors as he did.

Among his qualifications for usefulness his executive tact was

remarkable. As a presiding officer over deliberative bodies he was the right man in the right place. At all times and places but especially in such public positions, his dignified and commanding presence aided essentially in enabling him to effect the objects which he desired to attain. His personal influence has been sufficient to magnetize many a half-dying form into active life. And this strong personal characteristic was especially remarked among his friends. No one approached him in doubt, in despondency, or in embarrassment, and left him without a higher hope, a stronger courage, and a manlier faith in himself. It is impossible that any man should perform, single handed, the various labors we have recounted, but Mr. Wilder's magnetic personal influence was such that he drew to his aid men who were surprised and pleased at the quantity and excellence of the work they came to perform under his leadership, and which without him would have remained undone. And such coadjutors were always rewarded with his hearty appreciation of their services. That he himself loved the praise of men his friends all know, for he admitted it with a freedom which disarmed all criticism, but while desiring the approbation of his fellow men he sought it only by seeking to deserve it. There are benefactors of their race whose usefulness is not discovered until they are gathered to their fathers. More fortunate than these, Mr. Wilder lived to be appreciated. He was surrounded with prosperity; his path was one of peace; sweet odors were on every side. It was a pleasant sight to behold this patriarch at the rooms of the Horticultural Society on Saturdays, receiving the tributes of affection and respect of his friends and returning all their love, and it is pleasant now to recall it.

His instincts were conservative. At his eightieth birthday festival his pastor, Rev. James H. Means, D.D., testified that he was always a peacemaker, and we trust that he has received the blessing promised to such. A striking trait of his character was prominently exhibited in always discovering something to admire, to cherish, and to encourage in everybody and everything. He did with his might what his hand found to do, and inherited to the full the family trait of not leaving unfinished what he had begun. While cultivating his grounds and introducing new seeds, trees, and plants, he was doing all he could to instil into the public mind a taste and love for rural labors, and to elevate the rank and position of those engaged in the honorable employments of the farm

and garden. He spared no expense, he rested from no labors, in his desire to effect this object. He not only by his zeal, industry, and ability conferred lasting benefits on his native country, but by his careful researches in hybridization and fruit culture he laid the horticulturists of all nations under obligations to him. Through the institutions which he founded his service to men becomes self-perpetuating, but the world which he made a different one to us is different to us since his departure.

BUSINESS MEETING.

SATURDAY, January 8, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President BENJAMIN G. SMITH in the chair.

The Annual Report of the Committee on Gardens was read by John G. Barker, Chairman, accepted, and referred to the Committee on Publication.

Francis H. Appleton, Chairman of the Committee appointed at the last meeting to nominate a candidate for the vacancy in the Executive Committee caused by the death of Hon. Marshall P. Wilder, reported the name of Edward L. Beard. The report was accepted and Mr. Beard was unanimously elected.

Edward L. Beard moved the appointment of a committee of members of the American Pomological Society, to coöperate with the Committee of Arrangements of this Society in regard to the meeting of the former Society in this city in September next. The subject was postponed until the next meeting.

Adjourned to Saturday, January 15.

MEETING FOR DISCUSSION.

THE PROPAGATION, PLANTING, AND GROUPING OF NATIVE TREES.

By LEVI W. RUSSELL, President of the Franklin Society, Providence, R. I.

It will be my endeavor in this paper to present some of the more important observations, facts, and impressions which my recreations among the native forest trees of New England have

afforded me. It will soon be seen that I do this not as a specialist in any department of arboreal study. Neither can I speak from an extensive practice as a tree grower, for I have been little more than a looker-on in that work. But it will be my purpose to emphasize, and to stir into activity, some of the better thoughts and intentions which must have occurred to you, concerning our notably rich and beautiful sylvan growth. And could I succeed in making more practical the desire which the members of this So ciety undoubtedly feel to preserve and propagate our friendly trees, with a view to the protection of our lands, and the adornment of our homes and highways, the main object of this hour would be accomplished.

Incidental remarks, only, will be made about trees in forest masses; for notwithstanding the vast importance of this subject, involving as it does the welfare—the very existence indeed—of our country as a habitable region of the globe, its present consideration would encroach too much upon the main purpose of this occasion. But leaving this phase of arboreal study, we would like to inquire about trees as they relate to our homes; as they shield us from the storms, and from the desiccating glare of our summer's sun; as they lend their grateful shade to suburban and country highways; or as they lure us to the leafy by-paths of the woods, and as they give their delightful charm to our landscapes wherever we walk or ride among the picturesque hills of New England. We would like to know how to make more and better use of this goodly source of beauty, of comfort, and emphatically of health, so lavishly provided for us in the native tree growth. Speaking generally, we have hardly begun to appreciate the value to us of the arboreal growth of our land. Said an educated and observant Scotchman to me (he was a successful horticulturist also)—"I am amazed at the indifference of your people to the variety and wonderful beauty of your native trees and shrubs. Your nurserymen and landscape gardeners are trying to grow those of foreign nativity, at a cost of many failures and disappointments, when there are better kinds all about them at home."

That, and more, is true. We have many of the finest representatives of most, if not all, of the different genera of trees and shrubs indigenous to climates like our own that can be found anywhere in the world. There are in the little State of Massachusetts about as many native species of trees fit for timber, shade,

and adornment as are found in all the different countries of Europe taken together. We have been accustomed to regard ancestral England as richer in native tree growth than New England. This impression we gather largely from British and Scottish authors, especially the poets. Much has been written by them about the forest parks of Britain, and numbers of her grand old oaks and sycamores have a written history running back over the centuries, even to the days of which only tradition speaks. From the time of the Druids, whose worship recalls to us the words of Bryant, "The groves were God's first temples," and down to the present day, the British people have loved the woods. With the inheritance of their literature, and to a large extent their traits of character, we have naturally something of their veneration for the forests—something of their regard for individual trees. The destructive improvidence which naturally accompanied the necessary felling of the woods, by the early settlers of New England, to meet the demand for tillage and grazing lands, is now being followed, tardily indeed, but we hope effectually, by intelligent efforts to repair the losses thus caused. The indifference to the beauty, the usefulness, the educating influence of single trees, groups, or hedge-rows, which was engendered in our New England ancestors by their view that all trees were but a hindrance to the purposes of agriculture, is gradually giving place to a recognition of their æsthetic as well as economic value. So we are now ready to inquire what our native arboreal growth affords; and what species are best adapted for special purposes and different localities.

According to George B. Emerson, in his Report on the Trees and Shrubs of Massachusetts, there are at least forty-five species of deciduous trees, indigenous to the state, which generally reach a height of from thirty to a hundred feet. There are also ten conifers, growing to an equal size. All of the latter are evergreens, except the larch.

Of the deciduous trees, four species are maple, three ash, four birch, four hickory, two cherry, two elm, four poplar, nine oak, and there is one of each of the following: — birch, chestnut, butternut, black walnut, linden or basswood, tulip, hornbeam, hop-hornbeam or lever-wood, buttonwood, sassafras, nettle-tree, and hackberry. Besides these trees there are of shrubs, or small trees, one maple, one birch, two cherry, and two oak.

The conifers are composed as follows: one hemlock, two other spruces, two balsam fir, three pine, one juniper, and one larch.

This great variety may be accounted for by reference to the marked differences in the soils, features of surface (including elevation), and exposures of different localities.

From such an abundance, then, the tree planter may take his choice. He can find some tree in the list to produce almost any effect of sylvan growth that he may desire. He can find trees adapted to any locality, from a rocky hill-top to a bog; to any texture of soil, from shifting sands to the stiffest clay. A few of these trees are already approved favorites, among them the Maples.

The Rock or Sugar maple, *Acer saccharinum*, is the best of this genus. It is a handsome tree from the start, stately and well balanced in maturity. Its foliage affords deep and cooling shade in summer, and is gorgeous as the sunset clouds in autumn. It will bear more mutilation and ill usage and still thrive than almost any other tree. As a wayside tree, in exposed localities, it has few if any superiors, it being always erect, even where the wind has the fullest sweep. As a pasture shade for cattle, it is peculiarly well adapted. No better work can be done for the many bare, open grazing lots all over New England than to plant, here and there, for shelter and shade, groups or single trees of this kind. They would not only give great comfort to the grazing stock, but please the eye by their scenic beauty. For windbreaks, these trees, in single or double rows, are well adapted, although the white pine will insure this purpose more effectually and in less time.

As a rule, it is a mistake to transplant these, or in fact any other trees, from the woods; where they grow tall and slender. Even if they are severely topped, it takes them years to adapt themselves to their changed conditions, if indeed they live at all. If naturally grown trees are used for transplanting, they should be taken from hedge-rows or borders, where they have had free development in sunlight and air. Generally speaking, it is much better to take nursery grown trees for transplanting than to depend upon seedlings growing naturally. Nursery trees have better roots, more shapely tops, and if not too thickly massed are more hardened to the weather than those from the woods. And every farmer should have his nursery of forest trees—*and his boys should have the larger share in it.* There is nothing about the old home, not even the well-sweep and the bucket, which more endears it to the boys when grown to manhood than the trees

which they helped to plant. We deplore the exodus of our young men from the New England homesteads to the West and other parts of the country. If we would keep them, we must make them love the land of their birth; and I believe one factor in doing this is to attach them to the soil through the practice of tree planting.

The Red maple, *Acer rubrum*, also known as the Swamp (and improperly as the White) maple, is in my judgment too little esteemed, as a tree for ornament and shade. When this is alternated with the rock maple the two kinds form, together, a far more attractive row for the roadside than either alone. This arrangement breaks up the monotony and stiffness of a row of one kind only; and gives, especially in October, that mingling of gorgeous colors, of mellow tints and shades, so characteristic of the autumn foliage of these trees. A fine grouping of these two species is sometimes seen in nature where a few tall rock maples form the centre of the group, while the red maples, lower in stature, are clustered around. The red maple is richly worth growing near our homes for the brilliant scarlet blossoms, which precede the dainty leaves that, in crimson tints, soon follow. This tree, although occupying with us many tracts of low and swampy ground almost to the exclusion of other trees, thrives well on high lands if started from the seed on similar ground. But an almost certain failure will be the result of setting in dry ground a maple or any other tree taken from a swamp.

The White, Cut-Leaved, or Silver maple, *Acer dasycarpum*, is rare, as a native, in Massachusetts. It grows naturally near streams, which it is frequently found overhanging; but flourishes well upon the streets of our towns. It is a tree of rapid growth and graceful ramification of limbs, and has a foliage attractive in form and cheering in the silvery sheen which it shows in the breezes. It is too tender a tree and too liable to be broken by ice for the colder hill regions of this State. Numerous variations and "sports" from this tree are propagated by nurserymen, and some of them are notably fine for the lawn and for special ornamental purposes.

The Norway maple, *Acer platanoides*, a large spreading tree with deep green shining leaves, and the English Sycamore maple, *A. Pseudo-Platanus*, having much the aspect of our rock maple, are valuable additions to our natives; but lack the beautiful coloring displayed by the latter in autumn.

The Birches deserve more attention than they have received from tree planters. The Black birch, *Betula lenta*, in open ground forms a stately round-headed tree, and its numerous slender, finely divided branches, sometimes drooping, lend gracefulness to its aspect. Upon the borders of a pond, or by a brook, it is a charming tree, its sprays often touching the water.

The Yellow birch, *Betula excelsa*, rarely has the opportunity of developing in the open ground; but left to itself it is a tree which limbs low, sending out a large number of long lithe branches forming a semi-orbicular head of imposing dimensions. I knew of such a tree that came up from a crevice in a ledge of rock, and in time threw out huge surface roots, which grappled the rock with a Titan's hold; until, having fed from soil which they finally reached, it grew to a spread of fifty feet, forming in summer a huge mound of foliage, and in the ice-storms of winter a crown of sparkling, dazzling beauty, which even in my boyhood I looked upon with admiring wonder. The tree was cut down for a cord of wood!

The Paper White or Canoe birch, *Betula papyracea*, reaches its fullest development farther north than Massachusetts. Yet in the cooler hill regions of the State it is a fine tree; and if planted will grow well even much farther south. In the open ground it develops a stately head, broadly oval in outline, with rich, dark green foliage. But its characteristic beauty is seen in the forest or mingled with a thicket of other trees. There it shoots up with a straight, slender, milky white stem, without a limb, until it overtops its companions of other kinds with its thick-leaved head—one of the neatest, most graceful trees of the New England woods. It has been fitly termed "The Lady of the Forest." For tree grouping it is one of the best.

The Red birch, *Betula nigra*, is rare in Massachusetts, yet numbers of them are found upon the river banks for several miles above and below Lowell. This tree when fully developed is conspicuous for its large, dense head; formed by long, slender, somewhat drooping branches; a fringe-like spray often crowding the larger limbs near the trunk. It is also noticeable for its copper-colored bark; the outer layers upon the limbs, and upon trunks not too old, hanging loosely in long, ragged strips. Alone or among others it is a striking tree, and one of the best for growth by quick-flowing streams, serving at once to hold their banks and to add beauty to the scene. The wood is also valuable.

The Little Gray birch, *Betula populifolia*, commonly called White birch, is associated with barrenness, poverty, and neglect. Yet its fastigiate style of branching, its jaunty catkins in early spring, twirling like things alive, and the notable beauty of its foliage in summer should recommend it to our favorable regard. If we had to purchase it as a foreign tree we should, I doubt not, esteem it a fine acquisition for the tree border or the lawn. Certainly it is one of nature's restorers of worn out lands, and a valuable protective "nurse" for other seedlings.

The birches I believe are deserving the attention of tree growers, whether planting in masses for fuel and timber, or for scenic effect. A well arranged group of our native birches would be a delight to any lover of trees; and planted singly, in open grounds, they are all attractive.

I will now speak of the American or White Elm, *Ulmus Americana*, the home tree of New England. This tree combines more of the qualities which we admire in different trees than any other of native or imported origin: qualities which seem incompatible when associated, but which in the elm harmonize without a fault. Massiveness, strength, amplitude, loftiness, defiance of the blasts; yet the most graceful curves, limbs elastic as the Indian bow, pendent spray, light and lithe as the willow — all combine in one tree — a magnificent dome of sylvan shade,

> "Fit shrine for humble worshipper to hold
> Communion with his Maker."

The English elm, *Ulmus campestris*, of which there are some noble specimens upon Boston Common, has some but not all of these qualities. The poet Gray, in his Elegy, speaks of "those *rugged* elms," a term fitly applied, for in the distance the tree has much the aspect of an oak, with but little of the gentle grace of its American cousin.

While the "dome" shape seems to be the normal type of the American elm, it varies greatly from this in certain specimens. Some are far more drooping in habit than others; and their spread as compared with height is so various as to give them, in the distance at least, the effect of different kinds of trees. Their varied outline suggested to Mr. Emerson the following distinctive terms — to which additions might be truthfully made: the "Dome," the "Vase," the "Parasol," and the "Plume." I am

sometimes asked whether the tendency of a young tree, in regard to form, can be discovered early enough to ensure the kind desired for planting; also whether seeds from a particular variety will produce the same shape in its progeny. In regard to the first point, the tendency for the decidedly drooping, or weeping, habit can be recognized in a tree twelve or fourteen feet high, if the tree has had proper space for development. Concerning the second point, we have the testimony of experienced nurserymen that seeds from differently shaped trees cannot be relied upon to produce the same forms. The "Parasol" form is plainly the result of an early growth among other trees finally removed, leaving the elm alone, by which great height is made before the sudden expansion of the limbs at the top. The "Plumose" variety is not common, but of striking effect when seen. Some regard this form as the result of injury or accident occurring when the tree was young, while others think it the effect of location. Certain it is that numbers of this form may be seen in nature in certain low-ground localities; while, again, one might ride for miles among the elms and not meet with one of this habit. The plumose tendency can be discovered before the tree is too large for successful removal.

The "Fringed" elm, which usually takes the "Parasol" shape, is a sample of what nature can do when in a mood for sylvan adornment. I do not care to reason about it but gratefully accept it as one of the most charming objects of our New England landscapes.

In planting elms, two things should be recognized: that they require a great deal of space for full growth, and that they are voracious feeders, the roots extending at least twice as far as the limbs. A century grown elm, overspreading the ample dooryard of one of our old New England homesteads, is a magnificent object; so too avenues of elms, with plenty of room, are a joy to all who view them or walk beneath them. But setting them closely together, or where in a few years heading-in or other mutilation or entire removal will become necessary, from their interference with buildings or with each other, is a mistake often committed. Plant elms, but not too many of them, nor too closely together.

Of the other trees which I shall notice, time will permit but a brief mention.

The Hickories are quite abundant in central and southern New England. There are four species in Massachusetts, all of which

grow within a few miles of Boston. They can best be grown by preserving those which are self planted. They spring up where nuts are dropped by squirrels, among rocks and in out-of-the-way places, where nothing else of value would grow. There they should grow. The Bitternut hickory, *Carya amara*, however, is a fine shade tree. It is a wide spreading, symmetrical, densely foliaged tree. The Pig-nut hickory, *C. porcina*, has a well-balanced cylindrical top, with rich foliage. The Mocker-nut, *C. tomentosa*, is a large irregular tree of not much beauty. The Shag-bark, *C. alba*, is a tree which the painters like for the picturesque effects of its irregular branching. These and most nut-bearing trees are best raised by planting the nuts where the trees are to grow. I need not tell the skilful nurseryman, however, that in the case of the hickories, oaks, etc. when properly treated in the nursery by transplanting twice at least, and pruning tap-roots, a growth of fibrous roots will be secured which will ensure success in a final transplanting.

The Oaks are among the most important trees in New England. As I have remarked, there are at least nine species in Massachusetts which grow to the size of trees; and two are shrubs. The smallest, the Chinquapin oak, *Quercus chinquapin*, grows only to a size sufficient for a whipstick or a cane; while the largest, the White oak, *Q. alba*, in size, strength, and all the sturdy qualities which we find in trees is truly the "Monarch of the Wood." But the destruction of our oaks (especially of the white oak) which is caused in supplying the demand for their timber is greatly to be deplored. It takes centuries for a white oak to attain mature growth; and it will live, a grand triumph of sylvan strength and beauty, for centuries after that. Six or seven miles from Boston, in the town of Belmont, near the Waverly station on the Fitchburg Railroad, is one of the most remarkable groups of white oaks in New England, and, for aught I know, in the country. They number twenty or more, and are scattered over five or six acres of ground. Some of the largest grow from gravel ridges which Professor Agassiz reported as probably the terminal moraine of a local glacier. Their roots, however, feed from the rich alluvial deposits near the ridges; and some of them drink from the waters of Beaver Brook. Professor Agassiz was interested in these trees, and I am told estimated the age of the largest, then lying partly decayed upon the ground, to be eight hundred years.

Others, still standing, are probably nearly as old. By the lowest reasonable estimate they must have been growing when Columbus crossed the Atlantic; and quite well grown when the Pilgrims landed. Most of these trees are still vigorous, although some of the largest show signs of decay. A few such venerable oaks are found here and there in central and southern New England; but year by year they are becoming rarer.

At this point let me ask if it is not a legitimate and praiseworthy object for this Society to labor for that education concerning trees, among the people, which shall lead to a recognition of their worth beyond their mere money value as so much wood or timber?

Of the other native oaks of this State, the Yellow-barked or Black, *Quercus tinctoria*, the Red, *Q. rubra*, and the Scarlet, *Q. coccinea*, are best adapted for shade and ornament. The Black oak is one of the best for shade. Standing alone, it develops a thick, semi-orbicular head, with deeply cut foliage of dark shining green, taking shades of orange in autumn. It grows rapidly and will flourish in poor soil. The Scarlet oak is a fine ornamental tree, quick growing, with an airy, open head, and deeply cut glossy foliage. Its scarlet tints in the coloring season are among the most brilliant of our woods. The Red oak as a hardy wayside tree, adapted for the cooler parts of New England, should rank with the rock maple.

The Swamp White oak, *Quercus bicolor*, from its frequent appearance in the low grounds of the eastern counties of Massachusetts, constitutes one of the characteristic features of the region. It is here a tree of second size, of narrow breadth, but made picturesque by the ragged branchlets thickly crowded upon the trunk below the main limbs. The tree seems to be battling with the elements, and perfectly at home in doing so.

I pass to another nut-bearing tree, the Beech, of which we have but one species, *Fagus sylvatica* var. *Americana*, of native growth. We are accustomed to think of the beech chiefly as a forest tree, and no forest in New England presents more points for admiration than one of beech. We rarely see this tree fully developed in open spaces, as when young it seldom escapes the browsing of the cattle; but when fully grown, in an open space, it is a wide-spreading, symmetrical tree. Upon near approach its smooth bark, long, finely divided branches, and clean appearance through-

out add to its attractiveness. It roots near the surface, which renders its transplanting when young easy; and, if done with care, successful. I have seen but few of these trees set purposely for shade and ornament; but these were fine trees, much prized by their owners.

The Chestnut, *Castanea vesca* var. *Americana*, is the loftiest of our deciduous forest trees. Although in open ground it is a massive, imposing tree, yet on account of its stiff manner of branching and formal outline it hardly commends itself for home or wayside planting. Its place is in pasture grounds or in waste corners of farm lots. There, in old age, when broken and mutilated by winds and ice, the trunk decayed to a mere shell — still, years after, bearing as in youth leaves, blossoms, and fruit — it is a grand and picturesque object, which excites at once our sympathy and admiration.

The Tupelo, *Nyssa multiflora*, is one of the rarer trees of New England. Its habitat is in swamps, near ponds and stagnant pools, which it frequently overhangs, and along meadow streams, from which localities it spreads sparingly to higher grounds. In its manner of growth it is the most eccentric of our native trees. The normal type of its outline approaches the "umbrella" shape; but without apparent cause different specimens run into a variety of grotesque styles of ramification. The branches usually incline downwards, but without curving; some straight, some twisted; some long, others short. The main branches are usually armed with numerous stiff but finely divided twigs, from trunk to tip. Occasionally, in open ground, may be seen a tupelo perfectly regular in outline; the closely crowded limbs resting upon each other, the thick, shining foliage covering all — a mound of deep green, glossy verdure. Such a tree is a gem in any landscape. The foliage in autumn is the most brilliant in its red and scarlet dyes of any we have; and it is the earliest in coloring. In this it precedes the red maple by from one to two weeks. So it flashes out from among soberer trees, often in gloomy surroundings, as though consuming in its own flame. Wilson Flagg says that this tree is one of the brightest ornaments of our forest in autumn. I do not think that it responds kindly to cultivation, and it might not harmonize well with the surroundings of artificially ornamented grounds; but in the wild and often desolate places which are its native haunts it should delight every lover of sylvan growth.

The American Hornbeam, *Carpinus Americana*, is a small tree with foliage resembling that of the black birch; having, in the style of its branching and the smoothness of its bark, the aspect of the beech. Its singularity is in its ridged or fluted trunk, and in the odd appearance of its fruit-sacs, which are composed of several transformed leaves united at their bases. In open ground this tree makes a broad, low, leafy head, of much beauty. It colors finely in autumn, presenting a mingling of rich purples with scarlet and crimson. It is nowhere common, but, in small numbers, grows by streams and the borders of damp woods. It seems to have largely escaped the notice of tree culturists, but is decidedly worthy of attention. It is a pretty tree, having too the merit of rarity.

The Hop-Hornbeam, *Ostrya Virginica*, also known among woodmen as "Lever-wood" and "Iron-wood," belongs to another genus; represented in this country by one species only, and in Europe by one. It is a small tree, with a round symmetrical head, having in its fine spray, its leaves, and the color of its bark a noticeable resemblance to an elm. It is striking in late summer from its numerous capsular heads, resembling hops, containing the seeds. This tree would be attractive in a collection.

The Tulip tree, *Liriodendron tulipifera*, exhibits the nearest approach among our natives to the great magnolias of the South. It is a tall, stately, quick growing tree, with a strong but informal style of branching. Its leaves are beautiful at all times, and its blossoms are its special charm in June. The tree is an ornament to any grounds, and it is sufficiently hardy for sheltered localities in Massachusetts. It is quite "local" in its native growth.

The American Nettle-tree, *Celtis occidentalis*, is so rare in this region that many who are quite familiar with forest trees have never seen it; or have confounded it with the elm, to which it bears strong points of resemblance. It is, however, a much smaller tree, and has only slightly its drooping habit. It is a hardy tree, persistent in its growth, whether upon the sandy seaside or in the crevice of a dry ledge. Well treated, it is a comely tree. It is readily distinguished late in the season by its stone fruit, with a thin sweetish pulp, blue-black in the autumn, remaining upon the tree through the winter.

The Hackberry, *Celtis crassifolia*, is with us a still rarer tree than *C. occidentalis* but strongly resembles it. A careless

observer would probably mistake it for an elm, unless he noticed the stone-like fruit upon it in autumn and winter. It is, however, a round-headed tree, completely filled with small, fastigiate branches. Body and limbs are thickly studded with corky knots. It is a singular tree, worthy of special notice. Massachusetts is probably its northern limit. There is a fine tree of this species near the canal in Lowell, which, with a few smaller ones near by, is the only one that I have seen.

I must pause here in my notice of our native deciduous trees; having reserved time for but brief reference to our native evergreens. In the central parts of New England we have three species of native Pines, all worthy of cultivation for use and ornament. The White pine, *Pinus strobus*, is a handsome and useful tree in all stages of its growth. Wherever the seeds are planted, by nature or the hand of man, the young saplings will quickly cover with a protective garment of cheerful green even bleak hill-tops, sand wastes, or neglected gravel-pits. For a complete, quick growing windbreak, no tree equals it. Developed singly, or judiciously grouped with other species, this tree produces fine landscape effects.

The Pitch pine, *Pinus rigida*, has a stiffness and often scragginess in its aspect in open ground, which makes it undesirable as an ornamental tree. But its usefulness in redeeming sand wastes and its fair proportions in good ground should secure it from neglect by the tree culturist.

The Red pine, *Pinus resinosa*, is a tree of pleasing effects. It reminds one of a pitch pine, but is in every prominent aspect a far handsomer tree. It grows erect, tall, rather slender, with its branches in distinct whorls, curving slightly upwards towards the ends. A marked beauty of the tree is seen in its long leaves, which grow in twos, and are grouped in distinct "brushes." It is of quite rapid growth, and considering its fine qualities should be highly esteemed as an ornamental evergreen. I have met with fine natural clumps of this species in the northern part of Middlesex county, Mass.

The three species of Spruce native in Massachusetts are found in most districts of New England. The Black spruce, *Abies nigra*, is a hardy tree, common in the cooler hill regions. It has a close thick-leaved head of symmetrical conical shape. The dark green hue of its foliage gives it a sombre effect when viewed by

itself; but it heightens the cheerfulness of other trees in judicious grouping.

The White spruce, *A. alba*, is a tree often mingled in the same forest with the black spruce. It is of moderate size, slender and more tapering than the black spruce, more graceful in its habits of growth, and a far better tree for ornamental purposes. It is highly recommended by nurserymen.

The most beautiful of the spruces is the *Abies Canadensis*, usually termed the Hemlock. A well developed tree of this species combines symmetry, gracefulness, and a certain refined freedom in its appearance which readily charms the lover of sylvan beauty. It will repay critical study. It is hardly reliable for hedges, but fine for standard growth. In nature it is one of the greatest charms of our northern woods.

Our native Cedars and Junipers and our American Larch are worthy of attention; but at this time I am compelled to omit further mention of them.

So much, then, for what remains of our native forest growth for the protection of our wind-swept hills, for the renewal of our desiccated plains, for refreshing shade along our highways and around our homes, and for pleasing landscape effects everywhere. We do not meet in our woods that luxuriant growth and those gorgeous blooms which distinguish the tropical forests; but the variety in habit and form of growth among our native trees, and the delicacy and beauty of their foliage afford never-ending delight to those who have been led to note their attractions. Said a friend to me, "God be praised for the beauty of an oak leaf!" He spoke well; and he might have multiplied his praises a thousandfold, as applied to all the varied beauty of our woods. But to get the best of a thing we must know it thoroughly; so to derive the fullest enjoyment and largest benefit from our trees we must be led to know them; to see wherein they are useful, picturesque, or beautiful. Emerson says, "A tree which furnishes a cooling shade to the inhabitants of a house, is at the same time and on that account its best ornament," So people should be educated to recognize the fitness of various trees to serve different purposes; and thus their value and beauty will grow upon them. Hence I say that back of all the planting should be a knowledge of the tree itself; of what it is going to be and to do, if it grow. Springing up before us at almost every point, as we walk or ride,

is this varied and choice display of sylvan beauty; yet except by a few it is unappreciated — because, in the best sense, unseen and unknown.

Here then the question presents itself: How shall an efficient interest in trees be excited? and how shall a proper recognition of their benefits be disseminated among the people? This Society has already begun an effective solution of this problem by its official recognition of the importance of the subject, as seen in previous papers and discussions relating to it. But allow me to suggest that, to arouse and make permanent an effective interest in this subject, *we should begin with the young.* It is our desire to save the land from the desolation of deforestation, to preserve the proper balance between woodland and open ground; and this upon every man's farm as well as upon the areas of states and broader sections. We should wish at the same time to develop something creditable to us, as an educated people, in the scenic effects and rural embellishments of which our sylvan growth is capable. This work should extend along the line of many years. Like the tree, it should be perennial. Let the *boy* begin it, and in old age he will still be seen with a spade in one hand and a young sapling in the other, planting for future generations.

I have now come to the point of asking permission to indicate what I believe to be an effective way of introducing this subject to our youth; and with this permission I will read a few paragraphs from a paper upon the "Relation of our Schools to Arbor Day" which it was my privilege to present before the teachers of Rhode Island at their annual meeting in October last. In the course of the paper was the following:—"I have said that planting trees upon 'Arbor Day' is well; but it is not enough. To make the best of Arbor Day, there should be preparation for it; and in the schools this implies something to be done all along the school year, of which this is the crowning day. The time to begin this is in youth; gradually forming a habit of looking upon them [the trees] with an appreciative eye; gaining a knowledge of them, as may be done, with little trouble; enjoying them in their growth, in their protection and their shade, and as lovely and picturesque objects in the landscape. But what can the pupils of our public schools, already overburdened with studies, learn about trees? Should time and strength be taken to teach this subject?

We all advocate, I doubt not, the introduction of 'object lessons'

in some form into our schools; and I will venture to assert that no more interesting material for such lessons can be found than may be drawn from our native trees — their shape, their ramification, the appearance of the bark, the limbs, the buds, the leaves, the blossoms, the fruit, and other things which relate to their usefulness and fitness for adornment. It is profitable, doubtless, for a skilful teacher to give object lessons upon crumbs of bread, bits of glass, scraps of leather, fragments of ore, and the like. But a lesson upon some common forest tree might, if properly managed, give the pupil an interest in that tree which would last for a lifetime.

There is a strange and almost unaccountable ignorance about trees. Question even adult people upon the subject: What kinds of trees grow about us? What shapes do they assume? What soils and localities are they adapted to? When do they blossom? What shapes do their leaves take? How can different species be distinguished from each other? What trees should or should not be planted upon the streets, and why? Where should a rock maple be set? a red maple? a white maple? Why do hundreds of trees set in public parks die at once or live a lingering death? How many kinds of oaks have you in your State — hickories, birches, etc.? Of these commonest of natural objects, that furnish you timber, fuel, shade, fruit — that shelter you from the blasts, that give that incomparable beauty to our New England landscapes — that are your constant friends and companions from the cradle to the grave — what can you tell about them? Try a few of these questions and see what answers you get!

I grant that we should not attempt much in the way of forestry study in our schools; little or nothing which would add to the *task* work of the pupils. But I will indicate a few things which I think may and should receive attention, in this 'object lesson' work, and in preparation for an intelligent and effective use of Arbor Day:

First. Call attention to fine trees, easily observed in the vicinity of the school-room, or in the village, or upon the streets near by. Ask the pupils to name and tell about others. Bring out the facts about their forms, size, beauty, landscape effects, etc. Keep these general facts before them in all their subsequent observations.

Second. Call attention to easily recognized differences among some of the more prominent shade and ornamental trees, carrying this to the point of identifying different species of the same genus.

Third. Direct observation, at the proper season, to the various

parts of the trees, coming, gradually, to particulars; as, when the leaves are off, to the style of branching, seen even in a twig, and the consequent form of the tree. What better object lesson in spring time than a handful of sprays of the birches and alders, alive with their pretty catkins, each telling of its points to be observed and of the tree or bush from which it came?

Then it may be shown how the buds furnish, before the leaves appear, one of the surest means for the identification of the different trees. One oak has a large, thick bud; another, a small, pointed bud. The birch has a small, close bud; the beech a long, spindle-shaped bud, once recognized never mistaken. Make transverse sections of the buds, note their differences and their beauties.

The recognition of trees by their leaves is one of the most interesting and, in school, most easily managed means which we have. Children *will* pick up and handle and admire leaves, especially in the gala season of foliage; and why should we not utilize that natural curiosity and love for their beautiful forms and colors?

Fourth. Teach what trees are adapted for special purposes, and for different localities and soils. It is interesting to observe that there is this adaptation, and some knowledge of it might prevent lamentable failures in the work of Arbor Days, both public and private.

Fifth. The scenic effects of the different species, in all their variations of shape, ramifications, and foliage; in copse, in formal rows, in groups, in the forest, wherever nature or the hand of man has put them, should be impressed upon the pupils as opportunity occurs. Thus, like the tree itself, will appreciation of it grow.

So, again — in connection with the study of geography — the productiveness or sterility of certain regions, the recurrence of cyclones and floods or exemption from them, in given districts, would be explained by directing attention to the saving help of an abundant tree growth. It should be taught to the children, and thoroughly inwrought with their education, that the only thing which will prevent in our own country the desolation which has followed the deforestation of many sections of the old world is the maintainance of a proper proportion of wooded land."

The above and several other points were treated somewhat at length in the paper named; and the reasons for the introduction of this work into our schools were summarized as follows:

"*a.* Whatever kind of knowledge is of practical and general

use to the people should enter as a factor into the education of the young: and this information concerning trees will become in its application a perennial good to all.

b. There is no element of natural beauty that can be so easily or so inexpensively employed as that of the arboreal growth of a region like this; but knowledge and appreciation of it are necessary to ensure the best results.

c. Children naturally take to trees; they are therefore easily interested in everything about them.

d. Trees furnish a wide range of matter for the development of the powers of observation, comparison, and classification; and the material for these lessons is readily obtained, is inexpensive and always interesting.

e. A friendship is thus formed for trees; and its objects are never treacherous or disappointing. We naturally associate single trees with some person or family, some event, some treasured incident in our own lives. They stand as guardians of precious memories: thus — the old 'Homestead' trees, the 'Class Day' trees, the 'Liberty' trees and the 'Arbor Day' trees. Not less to us, and in a more intelligent way, do the trees of today speak, than did the forests of Dodona to the ancient Greeks who read oracles in their whispers."

But while preparing for future generations of workers through the schools and other less direct influences upon the young, there is still the work of today to be carried on. This may receive a very helpful impetus from organized bodies like this Society. They may properly encourage, or indeed originate the needed legislative enactments. Their members, recognizing the benefits of tree planting, could promote the work by forming in their several localities "village improvement societies," or more special associations for propagating trees. Better still, they can beautify the land through the silent influence of example. You can no doubt recall notable instances of what this modest method of work has done.

I have not promised much in the way of practical matter upon the topics which headed this paper. To what has been incidentally given I have but little to add. I would remark, however, that, as a rule, it is not safe to rely upon even a professional landscape gardener, if practically unacquainted with your grounds, to tell you what trees and shrubs to set, and where, for sylvan embellishment.

The picture which he may make will very likely look admirable on paper, but may be a disastrous failure in the attempt to make it real. A good knowledge of trees and shrubs in all their habits and a long and careful observation of the local exposures, climatic influences, and all other environments, are what is needed.

In grouping trees, if they are to be densely planted it is well to mingle those of deep-rooting habits, like the oaks, with those of an opposite tendency, such as the beech; also to place some of the evergreens with the deciduous trees.

If a characteristic development of single trees of several different species is the design, give ample room to each; or stunted, ill-shaped specimens will be the result.

In planting single trees, or groups, or rows, think how they are going to appear from different points of view, and what effect they are likely to produce upon the general picture.

Remember that a straight line of trees is stiff and formal, although sometimes it is necessary to place them so. For an avenue or vista effect uniformity may be desirable; but as a rule variety is more pleasing.

Planting trees thickly for present effect with a view of removing a part when they crowd each other, is not usually satisfactory, for those left never make so handsome trees as they would have done had they been allowed ample room from the start.

Trees should not be planted so near a dwelling house as to intercept the sunlight necessary for the health of the inmates, and this applies especially to the evergreens.

But while we should exercise care and foresight as to what and where we should plant, yet *plant trees;* encourage the work among the people; make a knowledge of and love for trees an object in the education of the young; and New England shall be what nature has done so much to make it—one of the most picturesque and attractive regions of this vast country.

Discussion.

O. B. Hadwen, Chairman of the Committee on Publication and Discussion, said that owing to the lateness of the hour there would be little time for discussion. He had learned much from Mr. Russell's paper. He spoke of the old elm tree in Congdon street, Providence, which he played under while a boy at school in

that city, and other old trees of various kinds at the grotto in the grounds of the Butler Asylum—a ravine with almost perpendicular sides and a road lighted with gas winding through it—which he visited last summer. He thought the Fern Leaved beech in front of the Redwood Library at Newport the finest tree of any kind he had ever seen; but it is not a native tree. Mr. Hadwen moved a vote of thanks to Mr. Russell for his paper, which was unanimously passed.

William C. Strong thought the paper very complete, but dissented from the commendation given to the Black Spruce. It does not hold its foliage as well as the Norway Spruce; and the White Spruce is also better.

Mr. Hadwen announced for the next Saturday a paper on "Chrysanthemums; their Varieties and Cultivation," by Arthur H. Fewkes.

BUSINESS MEETING.

SATURDAY, January 15, 1886.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President WILLIAM H. SPOONER in the Chair.

On motion of Edward L. Beard, William C. Strong, Vice-President for Massachusetts of the American Pomological Society, Benjamin G. Smith, Treasurer of the same Society, and George W. Fowle were appointed a Committee to act in connection with the Committee of Arrangements of this Society in regard to the meeting of the American Pomological Society in this city in September next.

Adjourned to Saturday, January 22.

MEETING FOR DISCUSSION.

THE CHRYSANTHEMUM; ITS VARIETIES AND CULTIVATION.

By ARTHUR H. FEWKES, Newton Highlands.

In a paper like this, more or less description of varieties would seem to be unavoidable; but as it would be a nearly endless task to describe them all, and at the same time would not serve the

purposes for which this paper was intended, I will confine myself to giving a list of such as I have found to possess superior qualities, selecting for description only a few that I deem worthy of special mention.

I do not pretend to say that my list contains all the varieties that are worthy of cultivation; but I think it will be found that all those I have selected are distinct and desirable sorts. As regards their cultivation, I will give an account of my own experience in the matter; following it with a few remarks upon seed raising.

In number, the varieties already reach far into the thousands; and each year there are added to this long list from fifty to a hundred more, by the various raisers of France, England, and America, and by direct importation from Japan.

While scarcely two varieties can be found exactly alike, many of them are so nearly alike that it is useless to consider them as distinct; for the time has come when the value of a collection depends more upon the judgment used in selecting than upon the number of varieties it contains. The selection of varieties is no easy matter; as everyone must know who has ever attempted to select a dozen or two from a large collection, especially if he has only a descriptive list to assist his examinations.

The diversities, in habit of plant, form of flower, and color of petal, are almost past comprehension; while the most accurate description that can be written falls far short of the reality, and can give but little idea of the true character of a variety.

How meaningless description seems when we compare our best efforts with the flowers themselves; for who can find words to describe the beautiful and endless variation in form of flower and petal and the exquisite blending and shading of colors that well nigh defy the skill of the best artists to represent. Their finest productions can do little more than give us a general idea of the beauty of the flowers.

In presenting a descriptive list of varieties I cannot hope to please every one, for the tastes of different individuals are often quite opposite, and what to one seems to contain all the elements of beauty to another is quite devoid of them. Thus to some the soft and delicate shadings of white and pink have no charms; and to others the beautiful blendings of crimson and gold seem gaudy; others can find no beauty in the delicately silvered amaranths; and so on through all the rich and beautiful colors so charmingly displayed in these flowers.

The classes into which chrysanthemums have been divided are ceasing to be of any great distinguishing value; for the Japanese run into the Chinese, and the Chinese into the Pompons, in such a manner that it is often difficult to tell to which class a variety belongs. As an instance of this I will mention the variety Duchess of Connaught, which is of pure Japanese origin, and true to its class when it first opens; but as the flower develops the petals gradually incurve, and at last form as perfect an incurved Chinese flower as need be. Also the variety Cullingfordii is as much Japanese as Chinese; and it often happens that from a lot of seed produced by a single plant we obtain varieties ranging in size all the way from large Chinese to the smallest Pompons.

But generally speaking those varieties are considered Japanese that have long feathery or ribbon-like petals, either reflexed, incurved, or falling about in a very irregular manner; while the Chinese have a very smooth and compact flower, either incurved or reflexed, with a regular outline. The ideal Pompon is very small in size, regular in outline, and with smooth reflexed petals; but it is sometimes quite large and somewhat incurved.

Among a great many beautiful varieties I will call your attention to the following, which seem to me to possess most excellent qualities. Twenty-five of them are Japanese, twenty-five Chinese, and twelve Pompons.

The Japanese are —

Belle Paule, white, shaded and edged pink.
Bouquet Fait, pink.
Daimio, amaranth pink.
Fair Maid of Guernsey, pure white.
Flambeau, crimson.
Fleur des Bois, deep brownish crimson.
Fulton, deep yellow.
Gloria Solis, yellow and crimson.
Gloriosum, light yellow.
Golden Dragon, yellow.
Grandiflorum, deep yellow.
Katakana, deep orange.
L' Incomparable, yellow shaded crimson.
Margot, buff and pink.
Mastic, nankeen.

M. Boyer, clear pink.
M. Délaux, brown crimson.
M. John Laing, brownish crimson.
Moonlight, pure white.
Mrs. C. W. Wheeler, orange and crimson.
President Parkman, bright amaranth.
Rosa Bonheur, deep amaranth.
Snowstorm, pure white.
Source d' Or, fine orange yellow.
William Robinson, yellow brown.

The following are Chinese —

Barbara, yellowish brown.
Cullingfordii, deep rich crimson.
Eve, creamy white.
Felicity, creamy white.
Gen. Slade, brown and yellow.
Gloria Mundi, deep yellow.
Guernsey Nugget, light yellow.
Hero of Stoke Newington, light pink.
Jardin des Plantes, deep yellow.
Jeanne d'Arc, white tinged pink.
John Salter, brown tinged yellow.
Lady Slade, clear pink.
Lord Wolseley, bronze crimson.
Mabel Ward, light yellow.
Miss Mary Morgan, deep pink.
Mr. Bunn, light yellow.
M. Roux, amber.
Mrs. Forsyth, white.
Mrs. W. Haliburton, white.
Nil Desperandum, crimson tinged with orange.
Prince Alfred, rose crimson.
Princess of Teck, white tinged pink.
Princess of Wales, white and pink.
Talfourd Salter, crimson and orange.
Venus, light pink.

All but six of the above are true incurves; many of them make fine plants, while others are more valuable for show blooms.

For Pompon varieties I will mention —

Antonius, light yellow, Anemone.
Brilliant, brown crimson.
Freemy, crimson brown.
Golden Mlle. Marthe, pure yellow.
Mme. Montels, light pink with yellow centre, Anemone.
Mlle. Marthe, pure white.
Mr. Astie, deep yellow, Anemone.
Mrs. Gane, pure white, Anemone.
Montgolfier, crimson and yellow.
Perfection, brown red, pointed yellow.
Salamon, reddish purple.
Sœur Mélanie, pure white.

Amongst the above are a few that ought not to be passed over with a simple mention of their color.

The Japanese variety Source d' Or is worthy of the highest praise. The flowers are not remarkably large but are of good size, reflexed, and very freely produced on stiff, erect stems. The plants are strong and bushy, and may be grown into large healthy specimens. The color is a rich yellowish orange, very distinct and bright; in fact, there is no other color exactly like this. With hardly an exception, whenever our plants are on exhibition at our greenhouses, this variety is the first or nearly the first to be selected by visitors, as it stands out distinct and bold from among all the others.

Equally distinct in color, but perhaps less valuable as a plant, is Katakana. When it is well grown there is nothing to equal this in its way, for color, which is a deep rich reddish orange. The flowers are of medium size, quite freely produced on erect branches, and the plant has a dwarf and healthy habit. In this variety the advantages of a moderate temperature, abundant sunlight, and fresh air are particularly noticeable; if these are wanting, the rich orange vanishes and the color is quite unsatisfactory.

L' Incomparable is another Japanese variety of peculiar beauty. It presents a pleasing combination of crimson and yellow. The ground color is yellow, heavily shaded with crimson in the outer petals, while the centre is quite pure. The shading appears as though a crimson powder had been dusted upon the yellow petals, falling very lightly upon some but gathering in heavy masses upon

others. The plant is dwarf and healthy, with an abundance of large flowers.

An entirely different style of coloring is seen in the variety Belle Paule. In this the flower is very large and double, with long reflexed petals of the finest white, overlaid with a delicate shading of pink which deepens into a distinct line at the edge. The plant is rather tall in habit but free flowering and usually healthy.

One of the most peculiar varieties, of recent introduction and of Japanese origin, is Mrs. C. W. Wheeler. The description as usually given is very misleading; for one would never know the variety from a description like this: "Immense perfect shaped flowers having outside petals orange and deep red centre." In fact each petal is remarkably broad and long and curves inward at the ends over the somewhat open centre. The outside or back of each petal is orange yellow, while the inside or face is of a rich brownish crimson. The flowers are very large and of great substance. Unfortunately this variety is very slow of propagation and in all probability will always be somewhat rare.

Of dark varieties, all things considered, Cullingfordii stands at the head. It is classed as a reflexed Chinese, but I have seen flowers of it that were as much Japanese as are those of Bouquet Fait and many other reflexed Japanese. The color is of the deepest crimson, very rich and lasting; while the habit is strong and healthy. The flowers are of medium size, but are produced abundantly.

There are many others that are equally worthy of extended description, but as it would be somewhat wearisome I will only call your attention to some of the most promising of the new varieties.

Among them — though not of the newest, yet of the most unimpeachable quality — I have already mentioned

Belle Paule.	Moonlight.
Cullingfordii.	Mrs. C. W. Wheeler.
Fleur des Bois.	M. Roux.
Frizou.	Snowstorm.
Gloriosum.	Talfourd Salter.

Though not previously mentioned I think equally well of

Beauté des Jardins.	MM. Thibaut et Keteleer.
Gorgeous.	President Arthur.
Hon. John Welsh.	

The most notable new Anemone flowered varieties are the two American seedlings Thorpe Junior and Mrs. Gane. Theformer is a large, perfectly formed flower of a beautiful pure yellow, raised by Mr. John Thorpe; and the latter a small, high centred, pure white flower of great excellence, raised by Mr. Henry A. Gane of West Newton. Timbale d' Argent though not of the newest is a beautiful addition to this class.

Among the newest I think favorably of the following, all of which belong to the Japanese class:

Domination.	Le Surprenant.
Enchanteresse.	Mlle. Mélanie Fabre.
Eugène Mézard.	M. Freeman.
Lakmé.	M. N. Davis.
L' Adorable.	Ne Plus Ultra.

Of the new Chinese varieties I think Cullingfordii, already described, and M. Roux are the most valuable. The latter is a true and perfect incurve, similar to Rival Little Harry, but of better habit.

Among Pompons I have seen nothing that seems to be a decided improvement upon older varieties, but the following might be mentioned as good — Black Douglas, Exposition de Chalon, and Élise Layellon.

The number of valuable early varieties seems to me to be quite small, and it is a question in my mind whether the very early ones — such as we have — are really desirable; for they come when the asters are at the height of their bloom, and are in no way superior to them, while requiring much more trouble in cultivation. If we could have varieties equal in beauty to our November flowering ones there would be no doubt of their desirableness: but such varieties have not as yet been attained. Those that have proved most valuable in my experience are the following:

Alexander Dufour, amaranth.
Lady Selborne, white.
Mme. C. Desgrange, white.
Mandarin, white shaded yellow and pink.
Mlle Lacroix, white.
Roi des Précoces, crimson.

On the other hand there are a few varieties that extend the

Chrysanthemum season far into the winter; in fact it is now not unusual to see them at Christmas. We find the following valuable in this way:—

Bicolor, orange and yellow.
Ceres, pink and white.
Ethel, white.
Gloire de Toulouse, amaranth crimson.
Grandiflorum, bright yellow.
Mrs. Charles Carey, white.
Snowstorm, white.
Thunberg, yellow.
And the new variety Le Surprenant,* crimson and yellow.

CULTIVATION.—With us the cultivation of the Chrysanthemum really begins as soon as the plant is through flowering; for it is in a great measure upon the good health of the cutting, taken from this old plant, that future success in cultivation depends.

Many growers, as soon as the plant is through flowering, cut it down to the pot, but this we consider a very hazardous thing to do; as many varieties seem naturally to have weak constitutions and these will sometimes refuse to start into growth if the old tops are cut off too soon. We usually cut the branches back quite severely at first, but the plant is never cut down to the pot until the shoots have begun to start quite freely from the roots.

The plants should receive as good cultivation after they have bloomed as they do before; for it is useless to expect a good healthy plant from an unhealthy cutting. From carelessness in this matter or from want of room, the old plants are very often packed away under the benches, or in some equally unwholesome place; and the consequence is that the shoots which start from the roots (from which the cuttings are usually made) will be very soft and weak, and one might say totally unfit for the purpose. Such cuttings should never be used when by any possible means better ones can be obtained. To mismanagement in this alone I attribute fully half the failures so common in chrysanthemum growing.

The chrysanthemum is essentially a sun-loving plant, and any encroachment upon its rights receives a sure penalty in sickly looking plants and blooms devoid of that exquisite coloring which makes this flower so charming.

*Specimens of this variety were shown by the essayist.

The plants as soon as they are through flowering should be placed in the sunniest position possible, with plenty of fresh air, judicious watering, and a temperature of from 50° to 55°. The matter of watering is a very important one at this time as well as through the summer weather. The plants are more likely to get too much water at this season than too little, but still they should never be brought to a wilting condition, especially after they have begun to make fresh growth.

As soon as the young shoots are three or four inches long, we take them off for cuttings; and place these in the cutting bench, in good clean rather fine sand.

Many cultivators advise no bottom heat for chrysanthemum cuttings; but we have tried both ways and find that by keeping them in a temperature of about 45° or 50° with a gentle bottom heat of about ten degrees higher, our cuttings will strike root much sooner and will lose nothing in health. Too high a temperature is a very prolific cause of failure in striking cuttings.

In making the cuttings such shoots should be chosen as have a fresh growing appearance, for those that are at all rusty or unhealthy, are quite sure to cause disappointment and trouble in the future.

In trimming the cuttings our practice is to cut off all but about three leaves at the top; for if more are left they are very apt to wilt, and after the cuttings have once become thoroughly wilted it is difficult to revive them, and often they will be a total failure.

The lower end is cut with a sharp knife, taking no notice whatever of the position of the leaves or joints; for the roots start as freely between the joints as they do below them.

Ample room should be allowed the cuttings while in the sand, for if they are too much crowded they are very apt to gather an excess of moisture, which will cause them to damp off; especially if they have previously suffered from dryness.

If everything goes well the cuttings will be rooted in about two weeks; and when the roots are from half an inch to an inch in length they are carefully removed from the sand and immediately potted into two and three-quarters inch pots.

It is quite important that the cuttings should be taken from the sand as soon as they are well rooted, for immediately after the roots are formed the cuttings begin to grow and there being no nourishment, to speak of, in the sand they necessarily become weak and stunted.

The soil into which the young plants are potted is composed of good sandy loam and well decayed stable manure in the proportion of about three of the former to one of the latter. Avoid a heavy clay soil, as the chrysanthemum seems to delight in one of a rich and rather sandy nature.

As soon as potted the plants are placed in a quite cool, light, and airy structure, and shaded for a few days from the bright sunshine by throwing a covering of paper over them. They are watered sparingly at first, but as the plants get accustomed to their new condition and begin to grow freely the quantity of water is increased as the condition of the plants may require; and from this time on to the end they are never allowed to suffer from want of water.

For the greater part of our plants that are to flower the coming autumn, the cuttings are put in to root from the first to the third week in March and potted as soon as they are well rooted; and when they have become established the healthiest are selected to be potted up preparatory to being planted out in the ground.

After the pots become well filled with roots, but before the plants become actually pot-bound, they are shifted from the two and three-quarters inch size to four inch pots and from that to five inch, as the necessity may be; for the plants should never be allowed to become pot-bound early in the season.

I should very much prefer an April cutting that had never been checked than one struck in February or earlier and allowed to become pot-bound; for one great secret of success in chrysanthemum culture consists in keeping the plants in a healthy growing condition from the time the cuttings are made to the time they come into flower.

With us pinching begins as soon as the plant is about six inches high. Our practice is to simply pinch out with the thumb and forefinger the smallest amount possible from the growing end, never cutting back to hard wood except in case of ungainly growth.

This pinching process is best done a few days or a week before the plant is shifted to a larger sized pot, for in this time the new shoots will have begun to start and will be in condition to use the nourishment supplied by the fresh soil.

Even when the grower has the advantage of a house capable of being ventilated to an unusual degree it is best to place the plants

in a cold frame as early as can be done with safety from frost. Here the plants can be hardened off and will be in better condition to start into growth immediately after planting out, which is usually best done about the middle of May.

For planting out, such a location should be chosen as will at all times have a full exposure to the sun and air. One so situated as to be protected from strong winds is desirable, but this should in no way interfere with the prime requisites of successful cultivation, sun and air. The plants can be so staked and tied that they will withstand all ordinary winds, but nothing will supply the deficiency of direct sunlight and fresh air.

With the proper soil and a high, open exposure, there need be little fear of mildew, the one almost unconquerable enemy of the chrysanthemum grower. For soil, we find a light rich loam the best, and prefer it quite sandy if possible; one that will not adhere to the roots in hard lumps but will fall away without taking the roots with it.

We place our plants about two and a half or three feet apart in rows. For each plant a hole about the size of a potato hill is dug and filled with manure, which is to be well forked into the soil. The hole is then filled up with loam; and we are careful that the surface is made lower than the surrounding ground, thus forming a kind of dish which will retain any water that may be given the plants rather than allow it to run away.

After planting out our plants are kept well watered until the roots have taken hold of the soil; from that time they receive no water unless the season be dry and the plants show signs of suffering, when we give it to them as often as needed; occasionally substituting liquid manure for the water. But whichever is used it should be applied at evening, so that it may not be evaporated before it can have time to soak into the ground.

As soon as the roots begin to take hold of the soil the plants will begin to push out branches very freely, and these branches as soon as they are three or four inches long are pinched in. This operation is repeated as often as the branches become long enough, until about the middle of July; after which the plants are allowed to grow at will, merely cutting back any unshapely branches that may grow.

There is a variety of opinion on this subject of pinching; some do not pinch at all, others only once or twice. But we find we

get more branches and consequently more flowers, by pinching quite frequently, provided it is not continued beyond the middle of July. The most severe pinching is done while the plants are quite small so as to secure as many branches near the bottom as possible. Of course the foregoing remarks do not apply to varieties that make shapely plants without pinching, for such are better left to their own resources.

Soon after planting out, each plant is furnished with a strong stake, and as the plant increases in size others are added in order to prevent the branches from being broken by the wind.

As the season advances many branches become so heavy that they are unable to sustain their own weight; and it frequently happens that what has promised to be a fine shapely plant will be irreparably disfigured by one or more branches breaking off. To prevent this we do not depend entirely upon staking, but from time to time, as the plants enlarge, we pass strings around them in such a way that one branch sustains another. By so doing we seldom lose any branches through the summer; and much time is saved when the plants are potted.

In the way of insects the worst pest to be encountered is the black aphis, which will cause much trouble if allowed to increase to any great extent. We have found "Dalmatian powder" applied with the bellows to be the most effectual remedy.

About the second or third week in August we begin lifting our plants from the ground. If the ground is very dry so much the better, for the plants will lift better and recover sooner than when it is moist. They are taken up thus early because it is better they should form their buds after they are lifted; for if the potting is left until late in the season the buds that are already formed will receive a severe check, which is apt to result in deformed or one-sided flowers.

The plants are lifted with all the roots that can be secured, but in order to get them into pots of a reasonable size a considerable quantity of the soil is carefully shaken from them, provided it is of such a nature that it will fall away easily without breaking off in lumps.

For this potting we use soil containing more manure than for the small plants in the spring, having about two parts of good loam to one of well rotted stable manure. The pots are selected according to the size of the roots, care being taken not to have them too large.

In potting large plants the soil should never reach higher than to an inch below the rim of the pot; for there should be ample room for giving an abundance of water and liquid manure.

After the plants are potted they are placed under trees, or, what is much better, a tent made of cotton cloth, where they can have plenty of air and at the same time be shaded from the hot sun.

They remain here about a week, or until they seem to have recovered, when they are taken to the same ground they grew in and plunged to the rim of the pot in the soil. As the plants begin to grow afresh they are given plenty of water that they may never become dry. The young roots soon reach the sides of the pot, after which liquid manure may be freely given so long as the buds are growing.

As cold nights approach, the plants are placed under glass, even before actual frost appears. I think it a mistake to try and keep the plants out until the actual appearance of hard frosts: for we have many nights not cold enough to freeze but cold enough to check their growth, and this checking of the sap is an acknowledged cause of mildew wherever it appears. All through the early fall we have days that are hot enough for midsummer and nights nearly cold enough for frost. This kind of weather cannot be conducive to health in the chrysanthemum; for it is a plant that must be kept growing from the time the cutting is struck until it has flowered.

For a long time after placing them under glass they require no artificial heat and should be very freely ventilated through the day. In cold, cloudy weather it is best to introduce a little heat into the house if only to dry out the dampness.

Soon after they have been brought in, the black aphis will make its appearance and should be persistently fought with tobacco fumes as long as the plants remain inside.

For those who have no greenhouse but wish to cultivate the chrysanthemum, we advise procuring young healthy plants in May and treating them in a way similar to that already described until the time for housing; after which they may be taken in on cold nights and placed out of doors through the day.

As house plants they should be kept well watered, syringed as often as possible (care being taken not to wet the flowers), and kept in the coolest and airiest place to be found.

The black aphis or black fly is usually found quite troublesome; but this can be conquered by persistent application of Dalmatian powder with the bellows.

If it is desirable to keep the old roots over the winter they should be placed where they may be kept quite cool, and if possible near a sunny window. Early in the spring they may be divided and planted out in the open ground and receive the same treatment as young plants.

The would-be cultivator must not expect that his plants will always be as large or his flowers as fine as those to be seen at our fall exhibitions, for the chrysanthemum requires unremitting care and attention from the beginning of the young plant to the end of the flowering season; and experience is as valuable here as elsewhere. But one should not be discouraged, for a fair amount of success is attainable with ordinary cultivation, and one will probably feel repaid for whatever time and expense he may bestow upon his plants.

The very large show blooms seen at exhibitions are the results of special cultivation, and should not be considered as fair examples of all that is good in chrysanthemums, but rather as exceptions showing to what a state of perfection they may be brought by skilful cultivation.

To produce these blooms we usually take late cuttings, pot them up as often as required, and keep them plunged in the ground through the summer. The plants are allowed to make but one stem, and this will usually branch into about three; and on the end of each will be formed several buds, all of which should be removed except the one at the extreme end, which is almost always the largest and strongest. By this means the whole strength of the plant is thrown into two or three flowers and sometimes only one. The plants must never be allowed to become dry and must be given liquid manure frequently.

As the buds begin to show prominently in the fall we go over our entire collection and disbud such as may need it; for some varieties form more buds than can be brought to perfection, and more or less of these should be removed as soon as it can be done with safety. Those that have large bold flowers receive the most benefit from this operation, and it should be practised even where they are grown as specimen plants. Of course, for this purpose fewer buds should be taken off than when specimen blooms are

required. The strongest bud should be left at the end, such only being removed as will interfere with its development.

As to plants intended to be grown for exhibition, such varieties should be chosen as produce an abundance of blooms of good color and are of a good healthy habit.

A plant having a scarcity of blooms or a poor straggling habit can be improved—but can hardly be made presentable—by fastening each bloom to its own separate stake. It is true that a certain amount of staking is always unavoidable, but it should never be practised except where absolutely necessary.

The ideal form for a show plant should be one with the height not exceeding the width; and much less when practicable. I say "when practicable," because there are many beautiful varieties that utterly refuse to be kept down to a low spreading form; as they throw but very few shoots (sometimes only one) when pinched back. Such varieties should be pinched back as much as possible while very young, so as to secure as many branches near the ground as may be.

A plant that can be looked down upon, or that has the whole mass of bloom considerably below the level of the eye, is much more satisfactory to the average observer than one with the blooms much higher, no matter how large the plant may be. A very beautiful form of plant when well grown is the trained standard; but it is seldom that we see it in perfection.

In selecting varieties for standards those that have naturally flexible branches should be chosen if an umbrella-shaped head is desired, and such as have very strong and stiff branches when a compact head is wanted. Avoid those varieties that cannot hold their branches on without the aid of stakes, for they are sure to be the most prominent objects about the plant. If a standard cannot be grown without the aid of more than one stake to protect the stem, the time and patience needful for its production had much better be applied to something that will give greater satisfaction for the outlay.

There are three things that should never be denied a growing chrysanthemum plant, viz.: water, sunlight, and fresh air; if either of these is wanting failure is quite sure to be the result.

Plants for exhibition should always be plainly and correctly named, for our shows are frequented by people who come to see what varieties are good and desirable, and to make notes of their names. If a plant is incorrectly named they may not at the time

know the difference, but when they attempt to purchase the same thing, under the name they have taken, they find it not attainable.

SEED RAISING.— This subject is one that should command the attention of every grower of chrysanthemums; for the operation of saving seed is a very simple one, and at the same time intensely interesting.

Until within about ten years all the new varieties were raised in Europe or imported from the East, but there is no reason why we should not raise as many good varieties here as elsewhere. Let us not, however, be too eager to thrust our productions upon the public; but let us be sure that what we do send out are of superior quality, and not be guilty of sending forth a host of inferior varieties.

All that is needful is to take the plants, after the flowers are fully open, and place them in a warm and dry place; any warm, sunny room will do. The whole object seems to be to prevent the collection of moisture among the florets, which causes them to decay before the seed arrives at maturity.

An abundance of seed may be raised without the aid of the brush, and many hold that there is nothing gained by artificial fertilization. But I have proved to my own satisfaction that it is attended with as good results in the chrysanthemum as with other plants.

Mr. A. Forsyth, in an article on raising chrysanthemums from seed, writes as follows in the "Gardener's Magazine" for April 20, 1872: "But how about hybridizing? you will ask. Permit me, in all sincerity and politeness, to say that hybridizing the chrysanthemum is fudge! Take your seed as you can get it, and with it take your chances of the crossing nature has accomplished for your benefit; but do not suppose that any one less gifted than a magician can manipulate the flowers of the chrysanthemum with the certainty that we operate on the flowers of geraniums and fuchsias."

Now I do not consider myself a magician, but in no less than five different cases I have accomplished the object I had in view by hybridization, or, more properly speaking, artificial cross-fertilization. That is, I wished to obtain the counterpart, in everything but color, of a certain variety. To be sure, not all of the seedlings were good; but in each case I began by selecting varieties that were as nearly as possible what I was striving for.

Mr. Salter, in his day one of the prominent raisers of chrysanthemums, has stated that he seldom saved as worthy of cultivation more than one out of two thousand seedlings. In the spring of 1885 I planted about forty hand fertilized seeds, and from their product I have saved, as being worthy of cultivation, six and possibly eight varieties.

This last spring I planted a seed, the only one formed in the flower from which it was picked, and from this seed I obtained one of the most distinct and beautiful varieties we possess. Strange as it may seem, this flower had none of the characteristics of the pistillate parent; but all of those of the staminate, except color.

As there has been considerable misunderstanding about the operation of hand fertilization, I will give a short explanation. Botanically, the chrysanthemum belongs to the Compositæ, an order of plants whose flowers are crowded together in a close head; this head is what is commonly called the flower, but if we examine it closely we shall find it composed of a multitude of very small, mostly perfect, flowers, often of two forms; those on the border having long flat petals, and those in the centre being tubular.

In its normal form the chrysanthemum resembles our common white-weed; but from long cultivation it has become double; or in other words the tubular florets have been converted into florets having the same long flat petals as those in the border. Usually by looking in among the petals a few of the tubular florets will be found still remaining, and these are the ones which bear the seed. In all the seed I ever saved I have never found one adhering to a floret with a ligulate corolla but always to a tubular one.

Ordinarily each one of these will be found to have a perfect pistil and stamens; and when the floret first opens the pollen will be found adhering to the outside of the closed stigmas. By taking this pollen on a small soft brush and carrying it to a floret on a plant of another variety, on which the stigma has had time to open, and brushing the pollen upon this open stigma, cross or hand fertilization is effected.

By simply placing one plant by the side of another, cross-fertilization is sometimes accomplished through the agency of the wind or insects. But in a very double flower the fertile florets are few in number and nearly inaccessible to insects unless the petals are

cut away; and even when this is done the insect is more likely to bring pollen from some single bloom than from a double one. Considering these things I think we have a better prospect of obtaining good results from carefully hand fertilized seed than from that which has been naturally fertilized.

As to the future of the chrysanthemum, I think it has come to stay; for blooming as it does at a season of the year when there is nothing to compete with it there is no reason why it should not hold a permanent place in the estimation of every lover of flowers.

Discussion.

E. W. Wood was called on and said that the paper was prepared by a cultivator who had given more direct personal attention to the chrysanthemum than almost any other; and it left little to be said. The chrysanthemum is of easy cultivation and comes to perfection in a short time. Nothing surprises visitors to our chrysanthemum shows more than to be told how short a time has elapsed since the plants were started from cuttings. The speaker emphasized the importance of beginning with healthy cuttings; he had lost some of his best varieties by inattention to this point. If a plant is not vigorous, or of only doubtful vigor, it is of no use to try to grow it; he had never succeeded in restoring an unhealthy plant. They cannot be grown under the shade of bushes but must have an airy, open place. Mr. Wood said in regard to temperature that one grower kept his plants in a cold grapery where it was almost freezing, so that they were dormant. One grower put in his cuttings the fifteenth of March, which is early enough for house decoration, but for exhibition a large proportion are started in January. If drawn in a warm greenhouse they are invariably spoiled. With a temperature of from 50° to 55° by night they will spindle and the tops will die and all the care that has been given them will be lost. Shifting before they become pot-bound gives a basis for large healthy plants for exhibition.

Mr. Wood hoped that some one would be able to tell the cause of the failure in almost every instance of satisfactory bloom from the chrysanthemum last season. There was much wood showing blind. He pinched his plants back as late as the 25th of July when the ground was unusually dry, and they did not make the growth after pinching which is desirable. He had thought this might

have been the cause of his ill success, but this theory was upset by the failure of those who watered. At all other times his plants have done well.

The chrysanthemum seems to come into bloom at a time when there is nothing else; other plants are then making their growth. Its increased popularity is shown by the displays in the florists' windows. There is no flower from which people can get more satisfaction when used for house decoration. But they are frequently put into too warm places, and then, having been previously kept in cool greenhouses, they will not last more than a week. If kept in cool rooms in sunny positions they will last six weeks. We have hardly commenced the cultivation of the chrysanthemum here, as compared with Europe. But the premiums for this flower at our next exhibition have been nearly doubled, and the speaker predicted that its cultivation and exhibition would largely increase.

Edward L. Beard enforced the practical suggestion of the essayist that healthy cuttings cannot be had from plants cut down at once. Many persons are in the habit of cutting down their plants as soon as they have bloomed. Bottom heat is used only by Dr. Walcott; who takes off cuttings and plunges them, after some weeks' growth, into a hot-bed where root action is stimulated by artificial heat, and allows his plants to get two feet high before planting them in the ground. The speaker thought the hardier treatment the more natural and reasonable one. He doubted whether the chrysanthemum could be made a good house plant; our rooms are kept too warm and the plants become bare or infested with insects. He built a temporary greenhouse five feet high at the back and two feet in front, so constructed that it could be taken apart, which holds about fifty plants. They lose their leaves owing to the dampness, and though they would doubtless do better with a little heat he had flowers until the fifteenth of December, when the thermometer fell to 10°— Antonius was perfectly hardy even then. He could cut a bushel of flowers, and he recommended the plan to amateurs. Artificial fertilization is indispensable to the development of chrysanthemum flowers in the fall. People complain that the chrysanthemum ceases to be valuable after the twentieth of December. He suggested cutting off the plants in late spring and growing them on, when they would bloom until February.

The speaker had noticed in Dr. Walcott's collection a seedling

which he considered an inprovement on Mrs. C. H. Wheeler. The color of that variety is somewhat dead, but this seedling was of an intense crimson, equally large and much more brilliant.

Charles M. Hovey said that he was very successful in raising chrysanthemums when no one else knew anything about them. In 1832 the prize for the best display was awarded to him by this Society. The chrysanthemum and camellia were then his pets. The London Horticultural Society took an unusual interest in the chrysanthemum, and in 1821 sent Mr. John Damper Parks to China to search for these and other plants, and spent a large sum of money in delineating and introducing them. Fifty years ago the speaker possessed sixty varieties which he had imported; they were good kinds and beautiful plants, such as the public want today, but it did not then take as a popular plant. Exhibition flowers are not adapted to general purposes. He cultivated them very much as Mr. Fewkes had directed, and had nothing else in the house. He had "tasselled" varieties which were very much admired; and he has continued to import the best varieties.

Their cultivation is easy in little plants two feet high. Plants cannot be expected to flower perpetually. He propagated by layers, turning out the plants and making the layers in June in five or six inch pots. They did not form exhibition plants, but very pretty ones for home decoration. He recommended this method to those who only wished to grow a few plants for that purpose. Neither the rose nor any other flower requires such unremitting attention as the chrysanthemum, to secure exhibition plants. He thought that he pinched too late. If the early kinds were planted in the open air they would afford much gratification. He had seen them in Newton blooming every year; if slightly covered with straw they will live through the winter in the open ground and bloom the second year. One year he kept his whole stock over. The chrysanthemum is really a cool house plant; too much heat brings the aphis. Division of the roots in May will give as good plants for parlor decoration as any way. He has divided plants of new kinds and saved them. He hoped the increased premiums would bring better exhibitions. The chrysanthemum was raised in quantities by Robert Buist of Philadelphia, and by others forty years ago.

W. C. Strong asked whether the late flowering of Le Surprenant, exhibited by the essayist, was due to the variety or to the cultivation.

Mr. Fewkes replied that the variety seemed to be a naturally late one; the buds were small when others were in flower. He had never practised taking off cuttings in summer to any extent; but so far as he had they flowered later.

Mr. Hovey said in regard to retarding blooms that he once placed some old plants under the stage to take cuttings from, but they bloomed in February and March. He thought this early flowering on new growth the only way to get them out of season.

W. A. Manda advised to strike chrysanthemum cuttings about New Year's day, and keep potting them on until a six-inch pot is used. He would pinch them until the middle of August. Plants thus treated furnished as good blooms as those not pinched.

They like sandy soil; the soil at the Botanic Garden in Cambridge where he is gardener is rather heavy, and they never did well until he mixed sand with it. When planted out he mulches them with straw or hay. When taken to the greenhouse they do best in the full sun and the house should be airy; then they do not lose any leaves.

Joseph H. Woodford spoke of the progress of chrysanthemum culture. When in Europe in 1866 he made note of the best growers. Adam Forsyth then took most prizes. He saw photographs of plants five feet high; and brought home rooted cuttings, which he gave to Mr. Edwin Fewkes, but there was then so little demand for the flowers that Mr. Fewkes only saved a dozen out of a hundred plants which he raised. People were not then educated up to the chrysanthemum, but now all commercial growers are doing their utmost to promote the growth of this flower. Plants must not be pinched down to the hard wood; if this is done they will not break.

Mr. Fewkes said that they saved only the White Trevenna and Gloria Mundi. The former was the only one that would sell. Last year they got only a hundred good plants out of seven hundred planted out. These were all treated alike, except that the good plants were grown in new soil and the others in soil that had had chrysanthemums grown in it for several years. He thought cold nights injured them; they were nearly all potted at the same time, but the hundred good plants were taken in earlier.

Mr. Hovey spoke of the magnificent display of chrysanthemums at the Crystal Palace, London, in 1879.

Mr. Fewkes remarked that he thought President Parkman, one

of Dr. Walcott's seedlings, equal to Progne. The color is not quite so deep but it is equally beautiful.

Benjamin G. Smith said that he had endeavored to cultivate fifty or sixty chrysanthemum plants, but had failed, and Mr. Fewkes's essay had taught him one thing that he did not know the importance of before — to plunge the plants after potting.

Mr. Fewkes said that plunging saves full half the watering. English growers say that manuring is a great cause of chrysanthemums going blind; he has never given a great deal of manure, but always some.

A paper by O. B. Hadwen on the "Degeneration of Fruits and Vegetables," was announced for the next Saturday.

BUSINESS MEETING.

SATURDAY, January 22, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President BENJAMIN G. SMITH in the Chair.

The Secretary read a letter from the family of the late Hon. Marshall P. Wilder, gratefully acknowledging the memorial of their father adopted by the Society, and the expressions of esteem for him and sympathy for his children.

Adjourned to Saturday, January 29.

MEETING FOR DISCUSSION.

DEGENERATION OF FRUITS AND VEGETABLES.

By O. B. HADWEN, Worcester.

The term degeneration, in its larger definition, when used with reference to fruits and vegetables, is generally understood to apply to those kinds, which, having been cultivated for a longer or shorter period of time, and having had their day and generation, seem to have run out and no longer to retain their original characteristics. Nature seems to have endowed every plant known in the vegetable kingdom with an allotted term or definite period of

life; especially when growing in its native climate and soil, and surrounded by conditions not unfavorable to its life, growth, maturity, and method of reproduction.

In attempting the inquiry into the period of longevity of fruit-bearing trees, and fruits growing thereon, together with the fruit-bearing bushes, shrubs, canes and vines, I find but few data relating to the subject, and must rely largely upon my personal observation and experience, and my own recollections of the past fifty years.

All the fruit-bearing plants are naturally grown from seed, planted by the intricate processes of nature. The seed contains all inherent natural forces requisite for reproducing its kind; and the seedling plant seems endowed with the vitality and functions requisite for and pertaining to its growth, maturity, and reproduction during its destined period of life.

The time allotted for the continuance of plant life seems as variable as the external features of the plant itself. While the limit of human life may be three score years and ten, in tree or plant life we know it may be many times three score years. The average lifetime of the lower animals is well known; but comparatively little is known of the life of fruit-bearing trees, and even less regarding the time our popular varieties of fruits will continue to be produced in perfection under the prolonged cultivation of the sagacious horticulturist.

The causes, natural and artificial, of fruits degenerating and becoming unworthy of cultivation are but imperfectly understood; as the many sorts seem to be subjected to many varying conditions. In the case of each we have to consider its natural hardiness and longevity, the influences of soil and climate, the stimulating effects of liberal cultivation, the mysterious influences of engrafting, both as to stock and scion. All these and similar questions underlying the subject are so clouded and obscure that we can neither fully explain nor comprehend them. Nevertheless there are some facts that seem to throw a little light upon the subject. While perhaps it is utterly impossible to fully verify the causes that seem to augment the degenerating tendencies in fruits, the facts we rely upon seem apparent, and although the evidence by which we trace the causes seems partially circumstantial yet it is unequivocal, so far as it goes, and cannot well be set aside, in communities where cultivation has been pursued for fifty years or more by "the art which doth mend nature."

The pear trees grown from seeds which were planted by the earlier settlers of this country were of a robust habit of growth, attaining large size and great age, and have outlived many generations of men; and of those known to have borne fruit as early as 1668 some are still alive. The pear tree is indigenous in sections of the northern temperate zone, flourishing as far north as the fifty-seventh degree of latitude, and is grown in this country from the British Provinces to Mexico. In acclimating and growing the pear in a warmer climate, its primitive habit of long life seems to be partly lost. Growers long since abandoned planting the seeds from the original fruit, using instead the seeds of the engrafted sorts, which are of a more tender habit; by this practice breeding into the pear tree an inherent tendency to shortness of life. The continued process of engrafting and forcing by high cultivation and also growing in an impoverished soil — each and all may exert some influence in the direction of degeneracy; and it is certainly evident that the trees are everywhere tending to earlier fruitage and shorter life.

The almost universal practice of propagating desirable sorts by engrafting or budding has undoubtedly the effect of gradually, but surely, working a serious injury to some fruit-bearing trees. The tendency of continuously planting the seeds of improved sorts is very much the same as what is called in cattlemen's parlance "in-and-in breeding," which if long continued in a given line is a sure and constant cause of degeneration.

Now, if the tree from any cause is losing its natural stamina and force, or becomes defective or diseased, the weakening of its natural functions very soon becomes manifest in the fruit. The St. Michael, in its day the glory of the pears, has now become wholly unworthy of cultivation. Sometimes it seems to recuperate in new countries and thrives for a time in a virgin soil, but soon relapses into its now normal condition. The Flemish Beauty affords another illustration of degenerating tendency. It was first brought into notice in 1834, and promised well for many years, but has now become unworthy of continued cultivation.

In the catalogue of trees grown in the nursery of the late William Kenrick in the year 1838 (he being then one of the prominent nurserymen in Massachusetts) I find, in the class termed "Old Pears," twelve sorts of which not one has been shown on this Society's tables for years. In class second, termed "New

Pears," I find eighty-seven; of which seventeen varieties only are seen at our exhibitions, and but four of these are generally approved, viz.: the Bartlett, Bosc, Seckel, and Angouleme, and the rest are only occasionally shown. In the list of new pears received in this country from Europe in the years 1834 to 1836, consisting of of a hundred and forty varieties, which have been tried by our cultivators and (most of them) shown on our tables within the past forty years, I find but two that are now considered worthy of cultivation; and Mr. Kenrick mentions a hundred other sorts received but not tried.

In the catalogue of the late William R. Prince of Flushing, N. Y., for the year 1839, designating by name three hundred and sixty-seven varieties, I find but thirteen varieties that are seen on our tables. Then we are made aware of the very numerous sorts of pears which were being brought into notice forty or fifty years ago—more than three hundred and fifty varieties, out of which less than twenty are on our premium list for the present year, and the other three hundred and thirty have practically gone out of cultivation. In the meantime very many more sorts have been introduced, in large part seedlings of American origin; and out of this vast number twenty-five varieties would be quite as many as are worthy of the Society's approval and encouragement.

Now, it would be unfair to state that this very large number found unworthy of cultivation have degenerated; doubtless many causes contributed to influence their rejection. Some were found poor growers; the fruit in many cases lacked the qualities essential in good pears; some seemed naturally predisposed to blight and other disease; and many seemed unsuited to the soil and climate.

But it appears although difficult to prove, in the case of some sorts once highly esteemed for general cultivation but now become degenerate, that the tree has already lived the time allotted by nature, and its production of fruit in its enfeebled condition is prolonged only by nursing or by engrafting on other and vigorous stocks. This suggestion opens quite another phase of the question, viz., How much can fruitage be prolonged by the process of engrafting or budding?

There was formerly an adage, "He who plants pears plants for his heirs," while now he who plants pears gathers a crop in a few years; and the trees mature, bear fruit, and die, even before the heirs are born. But it can easily be demonstrated that the

natural lives of the original sorts of pear trees have been longer than the joint or aggregate lives of several generations of men; and also that the product of fruit from an original stock can be artificially prolonged by engrafting to an undetermined extent.

The apple trees that were grown from seed planted by the early settlers, and cultivated as early as 1663, in many instances proved long lived, some reaching the age of two hundred or more years; these trees attained great size, and bore immense crops of natural fruit. I know of apple trees still bearing good crops that have every appearance of being one hundred and fifty years old; and I know of engrafted apple trees more than sixty years old that are still productive and unimpaired. On the other hand I can point to an orchard which was set forty-five years ago, and has received high cultivation, that has already become old and worthless, having no force to make healthy wood or bear fruit. And I read that apple orchards in some of the Northwestern States do not average more than twenty years in bearing.

The process of degeneration or decay of the apple seems to be less rapid than that of the pear; out of sixty varieties, mostly of American origin, grown fifty years ago, more than forty are now grown and esteemed. In fact I can recall but few sorts once extensively grown that are proving worthless; and in reviewing the history of the apple it must be admitted that it is not only the most valuable fruit in this section of the country, but also long lived, and is manifesting at present but few signs of decay.

The Early Harvest and the Newtown Pippin seem to be on the wane, and a few more are tending in that direction. On the other hand the Rhode Island Greening, known in cultivation for one hundred and fifty years, is seemingly as good as ever, both in tree and fruit; and promises to last for a long time. The Costard, one of the oldest apples grown in England, was recorded in the thirteenth century.

Among the fruits that were formerly plentiful the peach is the best demonstration of degenerating tendencies; it is the one that seems least able to withstand the departure from its normal condition occasioned by engrafting and modern usage, and the effects of climate.

In former years the peach was grown from the stone exclusively and engrafting was not practiced. Then the trees not only escaped disease but withstood the vicissitudes of the climate unim-

paired, and produced abundant crops; the ground under them, within the memory of many now present, used to be literally covered with luscious fruit at the season of ripening; while the life of a peach tree often extended to fifty years, and, by cutting back to the ground and allowing it to sprout from the root, to even a much longer period.

But when the nurseryman commenced to prolong the existence of improved varieties of fruit by budding not many years elapsed before the loss of original stamina and hardiness became apparent. Before long (in 1818) that destructive disease known as the "yellows" crept in. This was first noticed or described in print by a nurseryman in 1823; it was very soon ascertained to be contagious, and that the disease had come to stay. In the northern sections of the country peach growing, always precarious, now seems utterly ruined.

The question of actual degeneration seems fairly settled, in the peach tree; and the fruit follows the tree and varieties have become lost. Now the question naturally arises, Can the peach be restored? Evidently not until the budded trees are thoroughly extirpated, root and branch. We must resort to the custom of our ancestors, of growing trees from seeds, and these seeds should be procured from sources where disease is unknown in any form. Then we may hope with reasonable certainty for another period of healthy peach trees and luscious fruit.

Many sorts of peaches reproduce their like from the pit; these fixed strains should be encouraged, and painstaking cultivators might impregnate the blossoms of such with pollen of good sorts. By saving the stones of fruit thus produced they would materially increase their chances of success in producing new and desirable varieties.

The cherry and plum do not manifest a tendency to degenerate; they seem to suffer through injury from insect enemies rather than from any inherent morbid condition. The varieties grown by the earlier cultivators are still known and esteemed; manifesting, even under the influence of repeated engrafting and of artificial modes of cultivation, a decided tendency to long life. Cultural practices which seem to have impaired the longevity of the pear and peach apparently have little if any effect upon the cherry and plum; thus leaving the question of degeneration in these involved in considerable doubt.

Among the fruits termed "small fruits" the strawberry furnishes the clearest evidence as to its duration of life. Of this fruit, as nearly as I can recall, the kinds that have been cultivated thrive about thirty years; although there have been a few instances of longer duration, and some whose term has been shorter.

Of twenty sorts grown by nurserymen and advertised fifty years ago, not one is known in cultivation, if we except the Alpine, which seems to be perpetual; as does also the wild or native strawberry. Within the past forty years hundreds of varieties have been produced from seed, brought into notice, and are now gone to give place to new seedlings; and but few now extensively grown have been known to cultivation twenty years. Of fifty-one varieties grown in the nurseries of the late William R. Prince in 1839, not one remains. The strawberry reproduced from runners gradually becomes enfeebled and unproductive; and passes away, giving place to new and vigorous kinds raised from seed, which seems to be nature's mode of reproduction.

The raspberry, blackberry, and currant are long lived, and sorts that were grown as far back as the memory of man runneth are as good now as ever, conditions being equal. New seedlings are brought out from time to time, which, as novelties, have a tendency to supplant the older sorts, but the Antwerp, Franconia, Fastolff, Knevett's, and Northumberland raspberries, and a dozen others are just as good as ever. Neither do the blackberries or currants, when well grown, give much if any evidence of degeneration; when they fail it may fairly be attributed to the influence of poor soil and cultivation.

Vegetables, especially those annually grown from seed, cannot degenerate; seeds may become mixed and new sorts may be produced, but the annuals cannot be classed among plants that degenerate. Some seasons are found unfavorable to the development and growth of certain kinds; and new sorts are continually being introduced and tried.

The potato, indigenous to the mountainous sections of Mexico and South America only, is consequently, when cultivated here, far removed from its native home; and it affords us the best illustration of the importance of renewal by seed. As usually propagated from the tuber, it grows and thrives well for about twenty-five years, after which it manifests a very decided tendency to degenerate; and new seedlings are resorted to, which in their

turn will last a given time and produce good crops. Within my own experience, I have grown the Black Rusty Coat, Long Red, Chenango, Rohan, Peach Blow, Carter, Jackson White, Dover, Davis's Seedling, Kidney, State of Maine, Early Rose, and Hebron; and several other sorts — but only two of all these are now cultivated.

To attempt the inquiry into the growth, longevity, and decay of the fruits and vegetables we cultivate — to seek to learn the natural principles involved in the growth of each species, and the laws and principles of decay belonging to each, is particularly difficult where each seems to be governed by different and intricate forces, pertaining to its peculiar organism. Nature, with man's assistance, has produced fruits and vegetables in wonderful variety and profusion and of the highest excellence, and is still pressing onward; every season brings some new success in the line of fruit or vegetable raising, and notwithstanding there is so much mystery clouding the whole subject — so much that we should know but do not — so much guesswork, instead of positive information, and so much that seems impossible for the mind to understand peculiar to each plant — nevertheless it appears worth our while to discuss these questions, with the hope of new and increasing light pertaining to the philosophy and science of horticultural and pomological pursuits. There can be no end to horticultural investigations; and few if any conclusions in this hidden science can be considered final; and the subject we have been discussing still affords a wide field for inquiry.

The conclusions which I have been led to regard as provisionally established may be summarized as follows:

First. Each fruit-bearing tree and plant seems inherently endowed with a certain given period of life; this, however, is subject to be influenced by favorable and unfavorable conditions.

Second. Each species and variety of fruit-bearing tree and plant seems governed by conditions pertaining exclusively to its growth, maturity, and decay.

Third. Some fruits appear to degenerate, while others furnish but little evidence of deterioration; and the latter statement applies equally to vegetables, as a class, during this century.

Fourth. While there undoubtedly is a limit to the life of every plant and fruit, neither science nor philosophy has yet determined the data by which we can deduce with any degree of accuracy the duration of life of any of the larger fruits or vegetables.

The subject, as regards each fruit, seems to be governed by separate laws and conditions; and where such infinite variety exists, it renders equally limitless the extent of possible inquiry, and opens a wide field for experiments and experience; and also may be prolific in topics for discussion by the members of this Society.

Discussion.

Charles M. Hovey was called on by the Chair, and said that the subject had been treated by the essayist in a very able manner, and that it deserved the thought and attention of the members of the Society. That fruits degenerate we very well know, but whether from unfavorable climates or from other causes is not settled. The old varieties of peaches are still in perfection in England; within a week he had seen the Grosse Mignonne and George the Fourth recommended for cultivation as among the best varieties there. Of strawberries the Keens's Seedling, introduced in 1821, and the British Queen, originated about forty years ago, are still favorite varieties; though the latter is not suited to our climate. The Hovey's Seedling and the Boston Pine were raised by the speaker in 1833, and in his ground still give as good crops of fruit as ever. The Wilson, which has been more widely cultivated than any other variety, is still very good. We cannot raise the Flemish Beauty and Easter Beurre pears; they have degenerated here, but in California they are as fine as ever, and whether their degeneracy here is inherent in the variety is the question. Mr. Knight's opinion that every tree propagated from a seedling, being a part of that tree, perishes when the lifetime of the original tree expires, has been proved fallacious. The trouble is that the lifetime of one man, or even two, is too short to make reliable observations on this subject. Men must take it up in succession, if possible, but hitherto they have not done so, and the result is that we are continually beginning, and never come to any certain conclusions on the subject.

Grafting is undoubtedly sometimes injurious; the stock and scion do not seem to be congenial. Many varieties will not succeed on the quince stock; with the speaker the Glout Morceau and Angouleme flourish; and some of his trees have sent out roots from the pear, while others have not. He could see no degeneracy in pears except in a few varieties, such as the White Doyenne, Flemish Beauty, and Easter Beurre.

We can remember when we picked up the delicious peaches under the trees, but we do not remember how many seasons there were when the crop failed. He had been out among his peach trees and shaken them when the fruit almost seemed to fall into his mouth; for six or eight years he got a crop one year out of two. He had read much on this subject and had been a pretty careful observer, and had come to the conclusion that to explain degeneracy we must not look for causes inherent in the variety, though perhaps this may exist to a certain extent in some, but to other causes, climatic or residing in the soil.

To the question whether grafted trees ever go back to inferior varieties he answered, no. He felt doubtful as to the influence of the stock on the graft but he admitted the existence of sports. The Lewis, one of our native fruits described in the "New England Farmer" many years ago by Samuel Downer, Senior, is a very nice pear but too small and green, and he grafted a tree of that variety with Bosc. Afterward he noticed on another Bosc tree some small green pears growing on a graft; which some persons might have accounted for by the influence of the stock, but inquiry showed that the grafts used on this tree had been taken from the first mentioned Bosc tree, and some had been carelessly cut from Lewis suckers below the graft.

William H. Hills of Plaistow, N. H., said that the topic under discussion was exceedingly interesting. He had made many observations in regard to it. Some think that the Rose potato has degenerated, but we get them from Aroostook county, Maine, as fine as ever. When it was introduced he bought two pounds and from that quantity he raised two hundred and forty pounds. He cultivated them like others, with a light dressing of manure over the surface, except that for the Rose he added a handful of superphosphate in each hill, and he thought he could get as good results today. Sports are difficult to account for; on the Mayduke cherry trees there are every year branches where the fruit is from ten to fourteen days later than on the rest of the tree. There are certain conditions that we cannot understand. Last year he felt some alarm lest the Baldwin apple was degenerating; his were small, but he found they were as large as anyone's. His early apples were as large as ever, and his Russets never were finer. Something that we could not perceive had affected the Baldwins. It frequently happens that something which we cannot account for injures a crop.

Disease is distinct from degeneration. The Flemish Beauty pear cracks; is this degeneration or disease? He notices the cracking of apples more every year; the wound seems to heal inside and they seem to recover, but the fruit is still worthless; he thought this was disease but could not tell what produced it.

The fruit of the Baldwin apple trees that were on his land when he bought it is different from that produced by the trees he has planted. There is no fixed type of this apple, but in propagating he has always taken his grafts from trees bearing yellow fleshed fruit. A grape vine climbed into one of his best Baldwin apple trees and ruined the fruit by causing it to mildew, but he has cut away the vine and expects the fruit to recuperate. The modes of cultivation and peculiarities of the seasons are continually affecting fruit. Of sixty or seventy varieties of small fruits described a few years ago only four are in cultivation now.

E. W. Wood said that the question of degeneration had been much discussed, but no one could deny the fact, whether he attributed it to disease or other causes, He thought the essayist's comparison of vegetable with animal life might have been carried further. Man adapts himself to changes of climate by changes of clothing, and if we could do the same by trees we might be sure of good crops everywhere and in every season. Cultivation under glass effects this result, and hence peaches in houses retain their health and produce regular crops. He did not agree with Mr. Hovey in regard to the peach, but thought we cannot cultivate it as formerly. His recollection is that for a series of twenty years the crops were as regular as those of pears are now, or those of apples every two years, but if we attempt to cultivate the same varieties today we find a marked difference. He felt sure that plants do suffer from continued propagation by grafts or cuttings; he has grown remarkably strong verbena plants from seed, but they soon ran out when propagated by cuttings.

The Hovey strawberry was perhaps more generally grown in New England than any other variety thirty or forty years ago, and there is no better kind now if we could grow it, but we cannot. Mr. Hovey's own specimens are not up to the standard of twenty-five years ago. In later years the Wilson has been more generally grown than any other kind, but it is now being discarded.

Mr. Hovey said that he had seen Crawford peaches sold for a dollar and a half per dozen, and he had seen a basket full sold for

the same money. In 1807 Judge Peters said he had an orchard of two hundred peach trees, and he complained that they were subject to disease and decay; and that for forty years they had been short lived. This was near Philadelphia. Further south and in the western country and in some parts of New Jersey, they were durable and productive, as they had formerly been with him. The subject before the meeting is not degeneration in Massachusetts, but everywhere, and it should be remembered that this is not the native climate of the peach. The varieties are as perfect as ever.

Dr. Van Mons's theory of producing improved varieties of fruit was by beginning with the wild species and sowing the seed through successive generations; but any one would be called crazy now who should begin with the wild *Fragaria Virginiana* to improve the strawberry. He asserted that after several generations as good apples could be got from seed as by grafting. But the Seckel, Sheldon, Fulton, and all other fine native pears have come from cultivated varieties. There may be degeneration of culture; and we should be very cautious in attributing its effects to the degeneration of varieties.

Mr. Hadwen said that the fact of degeneration is not changed because we can point to some of its causes; but what has become of the old varieties? We cannot tell how long varieties can be made to exist; we may graft on vigorous stocks but even then the period of existence of varieties is unknown.

William C. Strong objected to the term "degeneration;" he would say "liability to disease;" the instances quoted seem to militate against the use of the former word. The Flemish Beauty pear has not degenerated. In some sections as fine specimens of this variety are still produced as were ever seen. So also in some sections of the country the peach is as vigorous as ever; so is the Keens's Seedling strawberry in England. Trees are sometimes invigorated by grafting on stronger stocks; the magnolia is an instance. The question is whether the tree has become more exposed to disease than it once was. The cracking of the White Doyenne pear may be caused by the soil having become exhausted of some element or elements necessary for its perfection.

Mrs. H. L. T. Wolcott asked, Could not the same Power which has limited the life of man to threescore years and ten have limited the life of trees also? Fruits and flowers certainly have gone out of date. There may be a conscicusness of old age on their part.

Mr. Hovey said that the Creator has endowed plants with the power of perpetuation by grafting, which he has not given to animals. The camellia was introduced two hundred years ago, and the Old White camellia is the same as ever. Varieties do continue; the Windsor pear is still good in England, though nearly two hundred years old, and there is a tree of the old Summer Bon Chretien at Mount Auburn as good as ever.

George Hill said that he had cultivated hundreds of varieties of strawberries and they have always degenerated and gone by, until now he cultivates only one variety, the Sharpless. Tomatoes also have run out; the plants would blast. As good plants as he could raise of the Boston Market tomato have blasted; the newer varieties are less subject to this disease. Hybrid vegetables will degenerate unless they are carefully cultivated, and the seed is carefully selected; and this tendency seems to be much stronger than the tendency to improve. Old seed is better than new which has been allowed to run back.

Mr. Strong thought the deterioration of vegetables propagated by seed might be due to close fertilization. What Mr. Hill had said about the Boston Market tomato suggested this point. Darwin's view was that cross-fertilization always gave the strongest plants. The effects of this method of propagation should not be confounded with those of grafting and budding.

Mr. Hills said that many of our improved varieties are more tender than the old ones, but the old varieties, once so highly prized, would not taste so good now as they did when we had no better. The further we get from a state of nature the tenderer they seem to become. We have a cultivated class of children as compared with those in the alleys of our large cities; are the former degenerated? It is the same with cows; the improved breeds are more tender, but they are not running out. Grafting on seedling stocks is surely changing varieties, though not perceptibly in one year.

The Chairman of the Committee on Discussions announced that on the next Saturday Miss Sara J. Smith, of Hartford, Conn., would read a paper on "Horticultural Education for Women."

BUSINESS MEETING.

SATURDAY, January 29, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The President, as Chairman of the Executive Committee, reported a recommendation that the Committee of Arrangements be authorized to employ experts to assist the various Standing Committees in the award of prizes at such exhibitions as to the Committee of Arrangements may seem expedient — this subject having been referred to the Executive Committee at the meeting on the 1st of January. The report was accepted and the recommendation was adopted.

President WALCOTT also reported from the same Committee a recommendation that the President be authorized to employ counsel to further the carrying out of the vote of the Society, passed December 4, 1886, concerning the securing of a site for a building for the Society in the Public Garden. This report also was accepted and the recommendation was adopted.

Adjourned to Saturday, February 5.

MEETING FOR DISCUSSION.

HORTICULTURAL EDUCATION FOR WOMEN.

By MISS SARA J. SMITH, Hartford, Ct.

To this Society, meeting to learn from each other and to discuss the best methods of improving our homes, our lands, our fruits, and our flowers, culling year after year from the wisdom of scientists and thinkers, and from the experience of practical workers, then publishing and spreading world-wide the knowledge thus gained — to such a Society as this it can be no marvel that the seed thus sown broadcast has taken root in the public mind, and from it has arisen a hope that, in the great educational revolutions now progressing around us, this question of a good horticultural education for our young women may find its solution, and bring forth fruit for generations to come.

From all over the land we hear rising a cry for some different, some more healthful training, physical and moral, than many of our girls are receiving — than that given in our higher public schools. Still no one as yet seems to know what this new education must be.

More and more is being crowded into the curriculum of study; nothing is taken out. Children are gathered earlier and earlier into the school fold — a fact telling plainly that there are mothers who feel themselves unequal to meet the demand of the times. Young girls graduating with the classes of boys prepared for Harvard and Yale are hurried into Vassar or Wellesley, or some other college for girls, for the so-called higher learning, and then too many of them are launched, with overtaxed minds and bodies, into society.

Is not this one cause of the "nervous prostration," so baffling to physicians, so ruinous to all home comfort, so disastrous to the future of husband and children; and of which we hear so frequently as an excuse for the inefficiency of the mothers — the fashionable mothers — of our times?

Here, in Boston, where there is no lack of interest in all that pertains to knowledge and culture, and where the public schools lead the schools of our country, it hardly seems worth while for one coming from outside of the State to speak of education; but perhaps this is the reflecting of the light you have thrown upon us, and we would still learn of you, that we may throw this light yet further on.

We all know of the kindergartens, and of the sewing, the cooking, and the night schools; also of the demand for trades schools. These are ostensibly for the poor, whom we shall always have with us, and more especially for a class of poor whose hours of school instruction are few, whose brains are not overtaxed with out-of-school study, whose bodies are strengthened by coarse food and work, and whose hands are put to use for support at an age when the pressure upon the brain begins with those whom they consider their more fortunate brothers and sisters.

The kindergarten is a part of the whole public school system now, and works well for the poor and rich alike. We have become almost Spartan in giving our children to the public for training. But schools of housekeeping or schools of horticulture cannot be grafted upon our public system to any advantage. They would prove but expensive and superficial appendages if they were.

We have all "been to school"— did we not find that our reading, writing, arithmetic, geography, drawing, music, grammar, and history, to say nothing of the spelling, were as much as we were able to compass before entering our teens? Did we have any too much time for playing, and growing — and idly dreaming between whiles, as growing children should to grow heavenward? Let us leave some time for this growing and playing and dreaming to the children of today. Let the crowding come late (if it must come at all); and let the schools for manual training for trades be separate schools. This seems desirable for two reasons:

First — Because children expecting to work at trades will work with ambition and love for their work, and compete more zealously with each other, in those schools, if not brought in contact with other children who are not expecting to do such work, and who being without incentive are doing nothing well.

Second — Because, having regard to the shortness of life and the vastness of work, the children wishing to be put at trades schools should be incited to enter them at an earlier age than would be best for those from whom more book study is to be required.

But it is not to discuss the training of young children that this paper is written; it is rather for the guidance of those who have passed through the halls of the public schools, and now stand looking out into the world with eager, longing eyes, and questioning, "What shall be next?"

To one who has studied the subject thoughtfully for years, as a practical educator, this question arises: Are there not still untrodden paths in the gardens and fields, enclosed by barriers stronger than stone walls, which should be, and could be, opened to the light tread of the wives and daughters of the land — fields lying fallow from the ignorance of the mothers and daughters, and barred in by the prejudice and indifference of the fathers?

Do you ever, when walking in your beautiful gardens, think of the many New England farms and homes without gardens? And do you ever reflect that there are daughters to inherit those places who are not taught each day, as your own daughters may be, by the beauties around them, and are not aided by your love and knowledge of these beauties to know and love them?

But, though we know these daughters have been, and still are, ignorant of the possibilities of what lies around them in their

homes, outside of their houses, we know also that from these farms have come more than half of the leading minds among the men of our country; men who loved their work and did not shirk; men whose bodies grew strong and wiry with out-of-door labor from their early boyhood, and whose minds were developed, not from a culture freely offered them, but in spite of the poverty of their opportunity, and who were strengthened by the very effort they had to make to allow no chance for learning to go by, no moment of leisure to be an idle one.

From bookless and indigent homes of the past we see emerging long lines of scholars, who by the very sweat of the brow earned their bodily support while gathering the knowledge for the brain. We glory in these boys, these men; we look with pride at their brilliant course in the world, and point to their cultured—perhaps elegant — homes, and contrast them with the homes they left. What a contrast in these cultured homes to those their mothers toiled and toiled in, without thought or comprehension of the beautiful things around their own doors that might and should have brought them recreation, and where these mothers died perchance from toil, that they, these men of letters, might be enabled to win the world.

When the career of such a one is remarked on, we know only the brilliant man — we little heed that mother; and yet these toiling mothers are, all over the land, dropping into silent graves, overtaxed, God knows; and another house-mother (how beautiful in its meaning is this word from the German — not solely the mother of the babe, or the child, but the mother of all under the roof-tree, if she be a true mother) another of these toiling house-mothers takes the place of the first; and then sometimes another still. It is a tradition that many of the beautiful farms among your Berkshire hills have been made beautiful and rich at the expense of the first, and second, and oftentimes the third wife's life. And why? Man toils from early dawn till dewy eve, but then may take a nap, or smoke his pipe and read his papers. Woman toils from earlier dawn — she makes the fire on many a farm — till dewy eve, then takes her needle and mends and makes the household clothes, till midnight, oft. Her rest, when found, is in the grave. Nature herself attempts no more; for after the budding of spring, the flowering of summer, the fruitage of autumn, winter's white shroud wraps her in her sleep of rest. Why toil these

mothers so? Where are their many daughters? Search through the land, and we shall find them fleeing here and there, preferring to seek life's toils and pleasures away from their homes. Why do these daughters flee from their homes? Have they been rightly educated — educated for their home life?

If we may believe the stories we hear of the olden time, the time of the spinning wheel and quilting frame, the daughters did not then, as now, leave their homes; else how had there been those chests of linen, those piles of bed-quilts, those blankets and sheets, all spun and woven and made, and laid away with "sweet marjoram and lavender," to await the marriage day and the journey to the new home, then the almost only going away of the young daughter. The remnants of such collections — tokens of the thrift and happy labor of those days — are precious heirlooms in many a family now. The dear old great-grandmother's blankets and quilts, the chests of yellow linen,—how carefully we cherish them; for the days are long gone by when love and duty created them. Who knows whether days like those can ever come again? Our girls, in their homes of today, can have no call for such work, and machinery, man's invention, has taken all this work from woman's home and hands, and left nothing, absolutely nothing, to fill its place.

What, now, can be given to them instead? Is all being done for them then that ought to be done — all that can be? Should not some new avenue be opened for the minds as well as hands of these girls — these daughters? They see the work around them — who teaches them that they could make it lighter and convert it into a pleasure? They feel the want around them — who shows them that there need not be want and privation in their homes? They contrast the little they have with the luxury which their father's work carries to the homes of others, and they wonder, these bright-eyed, irresponsible girls, and flee from a life that seems dark and hard; but they flee to a world that is dangerous, and harder.

Let us look at these girls at a later period. They have been hurrying through school, only to be free; and then aimlessly striving to support themselves away from home; turning to teaching, if soft-hearted committees will let them experiment in district schools; if not, then turning to the next best thing which seems to them exciting; probably the shop or the factory.

Is it not apparent that excitement is the demand of the young people of this age; excitement in life, excitement in literature, excitement in religion? Sad evidence of a wrong!

True, we need girls in these shops and factories; and there are in fact thousands of good, modest girls going out to toil in these places every day; girls with homes and friends and others without them; girls, too, who support themselves well, and take care of whole families besides. But there are enough, yes, far more than enough, who are compelled to crowd to these shops and factories to earn their daily bread — good, honest, hard-working girls and women, working faithfully in the places God has given them, and these would be better paid were it not for those other girls who crowd into their ranks, doing this not because they have no homes and must — but — to get away from their homes!

There is no reason why these employments should be sought by farmers' daughters, but every reason why they should not. These unsettled, unhappy girls are crowding in where they ought not — ought not because God has placed them where they would be better women to remain.

Can it be that there is in the education of the day, and perhaps also in the reading of the day, something that unsettles this class of girls, and tempts them from their homes; that causes them to long for excitement and crowds; that makes them bold and independent at an age when they should be retiring and yielding? Is not the tendency of the public schools, with co-education of the sexes, towards this public life, especially when brought to bear upon girls whose previous education has been in the quiet country district school?

Notice, when on an early morning railway train going into any of our northern cities, the number of girls and boys carried in to attend the large public schools. Day after day they go, perhaps for four years, wasting hours of that time in depots, or lounging in places far from home or school, when the trains are not conveniently arranged to suit school hours; making friends where they ought not; joking with railroad officials or other chance acquaintances; at first, simple, truthful, honest girls, who see no harm in it, knowing nothing, fearing nothing, but growing freer, bolder, day by day. Here and there are girls who will not be hurt by it; faithful, modest girls, who may be trusted to the world's end. It is not for these we fear, but for the sake of others we should

ask — Towards what does this all tend? Is it right and wise to put a girl into the midst of such temptation, and then expect her to be other than she too often becomes?

School days over, the excitement of graduation, the crowded house, the applause, all are ended, never to return — no more city life, no more railroad rides, no more excitement. A quiet coming home, and to a home which perchance may not be that home of beauty, of luxury and comfort and pleasure, to which it would be the good fortune of many of you to welcome your daughters, but a home such as we know hundreds of our brothers have on these bleak though beautiful hills, and damp though smiling valleys of our own New England. And most of them being totally ignorant of what might make such homes a pleasure, it seems to them a coming down to a mere round of cooking, and cleaning, and small economies that fret day by day. What a dull routine! How hard a one to be borne! Seldom company to enlighten; no money except for the barest essentials — only a weary, dreary home! The mother tired, the father silent, a brother absent, perhaps, or worse, indifferent. Work that is always pressing, no luxuries, no garden — even the songs of the birds serve but to recall the songsters of the city park, and to make her feel gloomy. And so comes the sad final break with home.

In all the routine of culture of soil and fruit and flowers and flocks, is there no pleasant place for these girls to step into, no welcome duty for these daughters' hands? Is there no way of showing them that they too have a mission, a heaven-given mission, on a farm?

It was settled some time ago that agricultural schools and colleges are quite as essential to train boys for agricultural life, as are other schools and colleges to train boys for other paths in life. Is it not time to conclude that there must be schools to train girls to home-life? And training them to home-life does not mean making them household drudges, but girls with healthy minds and bodies, loving nature and humanity, and with hands and hearts calmly, strengthfully, sweetly, prayerfully bearing the daily burden in a way that makes it no burden, but a God-given duty thoroughly understood — such girls will never be household drudges.

Our girls can be and ought to be taught to be better providers for comfort, better bread-makers, better home-keepers; but also, as home is not all within the house, they should be taught to under-

stand the garden, both as to fruits and flowers, and no less the poultry yard, the apiary, and even the sheep-fold; for attendance on these would be a kindly, womanly work for woman; and all the animate dumb creations of Heaven should welcome her steps.

Excepting that leading to the cultivation of the land, every avenue in life now seems broadly opening to woman. The liberal professions are becoming more and more accessible to her, through the enlightenment of public opinion, inclining to justice, and partially giving her a chance to do what she will do, if she may. Yet it is with much difficulty that she gains a foothold in them, and the jostling of her brothers is rougher than she likes. Crowded avenues they all are; though in the higher rounds of labor, and in the ranks of the brain-workers, there is always room for more; and where there is great talent, if there be given a certain amount of education, the talent will effectively develop itself.

There are young women whose souls are wrapt in study; who have genius, and who aim to be teachers of high degree, and artists, and doctors; yes, and lawyers. There is no difficulty in finding the educational training for these; the high schools and colleges, the art schools and museums, offer it freely. And there are women who would delight to wear the student's cap and gown, and are begging to be admitted with their brothers to Harvard and Yale. But, really, those fitted for such careers are few and far between. We hear only of the successful ones; many, many of the woman brain-workers have failed in these higher undertakings. When it became necessary that they should win a support by their learning perhaps they found the talent had been wanting — and no amount of education can make a genius — or the work was too masculine, or not womanly enough; and, unless driven by dire necessity, a cultured woman shrinks from the great push for places. And, alas! often she shrinks also from great responsibilities, or from paths not sanctioned by the schools and by the opinion of the public.

The woman who owns a farm and carries it on does it shyly, and as if she had no right to do it; and the girl who is quite at home in her father's conservatories and hot-houses, understanding the culture and knowing the botanical names of all the plants, is a wonder to her companions, and seems not quite one of them. Yet, how many a weary, heart-sick girl whose whole life has been spent amidst brick walls longs for a work in the green fields.

How many a woman who breathes the close air of the factory until the hectic flush tells of a life almost spent wishes she could have been taught a work that should bring her daily nearer to nature.

This work is one that she dare not, cannot, learn by herself, the risks are so great. She can catch up the broken threads in the loom, and scarce gives them a thought; the great machine seems to her to work of itself. But the tender plants, the opening buds, the flowers, the bees, the soft little chickens — how dare she, untaught, handle these mysterious things direct from heaven? Might she not chance to put out some of this life given to cheer and brighten the world? And she looks with feelings of wonder and shame at girls who inherit the right, the opportunity, to know something of all this, yet flee from it in their ignorant contempt of it.

What a cry of dismay is heard at a proposition to send a girl from home to learn house-keeping! and to talk of sending the daughters of farmers away from their homes to study horticulture may seem at the present time rank heresy; but this must soon come, like all other things for the good of man.

Seldom do we find the merchant, the doctor, the lawyer, attempting to train their own sons to enter their own lines of life; they send them to some one else for that training; and we also find the agriculturist sending his sons to schools and colleges affording scientific agricultural training. Then why may not his daughter in like manner be sent where she may obtain a scientific training in horticulture? And would it not be well sometimes to send her away for training in house-keeping? She *should* be taught that duty at home. But is the daughter always so taught at home? How hard it is to teach an unwilling daughter! How much easier it is for the mother to do it all herself! There are duties for every daughter that she does not usually incline to learn; indeed it is doubtful if any mortal inclines to duty as freely as ducks go to water.

How carefully considered is our selection of the seed and the scion; how careful is our training of the colts and the steers; but how like a weed in the fields, too often, grows the daughter of the house! And then how unfitted she will be to take a place in the great world of work. And if it is as an orphan she must enter there, with land as her inheritance, and little else but her land and

her natural love of the beautiful, how shall she shape her course, and what is she to do? What is that land to her, incapable and ignorant of its probabilities and possibilities? Where shall she turn? Who will show her what to do? Is there not some one who will strive to provide an opportunity for the right training of such young women in home-life and horticulture? Has this Horticultural Society of Massachusetts a school to take this ignorant little woman in, and teach her to be happy in her land — her inherited possession? No!

What have the public schools given her? A disciplined mind, a clear, quick acting brain; some knowledge of mathematics, and probably of Latin and Greek; and a slight acquaintance with natural science. God has given her a home and land, but all her school knowledge avails her but little towards caring for them; excepting the possibility that she knows how to survey her land, and cut it up for sale.

We are placed in this world not only for our own selves, but to do good to all within our reach, and is there not a noble work yet remaining to be done by this Society? From all its knowledge of plants and how to make them grow; of flowers and all their wonders; of fruits and vegetables and their uses; can it not tell, and show the world of woman, how she can make the garden her kingdom; the poultry and bees her subjects; and be healthy and happy in their culture and care?

Does not this world-wide cry for a "new education" come to rouse the lovers of horticulture, and to tell them that while they are surrounding themselves with all the beauties of the floral and vegetable kingdom, gathered from the far corners of the earth; while they are lavish in all that shall perfect these wonders of nature, there is a great world outside, looking longingly and lovingly on, and wishing for a slight foothold within the charmed circle; and still another, a world of indifferent young girls, who need just the knowledge this Society can give them.

And yet, how is this knowledge to be given them? The world stands wondering what the new education is to be. You hold in your power one branch of it, the horticultural. Give us a school that shall educate young women first in humanity; next teach them of Nature, to love and understand her; then teach them of the human care they should give to the inhuman they find around them; and, especially, teach them that to work is a heaven-given privilege.

Until recently labor has been growing less and less respectable since our great-grandfathers' days. A great artist* has lately said, "It is the curse of the age that young people wish to jump into maturity at a bound, and that the desire is not to do, but to 'get done'; to deal in the article, not to make. Respectability has cursed this age in this country — a craftsman is not supposed to be a gentleman."

This was said on English soil, but it applies as well here. Much of this perverted feeling, it is to be feared, is due to our public schools, but surely it is much more a result of the vast and sudden fortunes made since the days of our civil war. Those great and sudden fortunes, too often gained by trickery and knavery and spent in selfish luxury, have done much to demoralize our nation.

But a revulsion is taking place. Absconding knaves cannot be the nation's heroes, and selfish capitalists are looked upon with less of admiring reverence. Work is again becoming respectable. Work is ennobling. Our Lord saith, "My Father worketh hitherto, and I work." As a nation, we are beginning to realize that the noble faculties given us are meant for use; and that men and women who labor with their hands, guided by their brains (for it is cultured handcraft that this nation will have), stand on the same plane of opportunity with the men of learning and the men of money; for such men and women can be what they will.

It is just half a century since Mary Lyon struggled faithfully and successfully to found a school in this, her State, in the midst of an agricultural country — a school that should give to the daughters of farmers and others advantages in learning which they had not before enjoyed. To make the expenses small the girls were expected to do the house work, under competent supervision, and many a city father sent his daughter there to obtain a knowledge of house-keeping which she could not, or did not, receive at home. The fame of this "Mount Holyoke Seminary" spread far and wide, and for many years it was a shining light in the midst of darkness.

Since that day colleges and schools have sprung up all over the land; and the Temple of Learning which was pictured on the first page of the old Webster's Spelling Book and which to the childish

* Herkimer.

mind seemed a temple in the heavens, now crowns many and many a hill-top, calling our youth to its halls; and the way thereto, by comparison, is now a flowery one, but it is also one that consumes the freshness of youth, and leads from home.

That simple school, for which Mary Lyon toiled so long and well — that school, too, has kept up with the onward march of learning. Girls no longer go there to learn house-keeping. They go to learn to be teachers, and the curriculum of study is arranged for the "higher education," and designed to make learned women.

What we need to provide now is not this higher education; it is a new and different one; an education in horticulture and home-culture, that shall make a happier girlhood — happier, because hands are full and bodies healthy; happier, because brains are less strained for book lore, and more alive to nature's truths, and vivified with a practical knowledge of what goes to make health, happiness, home, and wealth. Among all the schools of our land — and their name is legion — there is not one to offer this to our girls. Is not now the time to make one that shall meet this requirement? Is it not to this Society — the Horticultural Society *par excellence* of the country — that we may look, to show us how this horticultural education can be given? You who know so well the difficulties that beset the way, and have shown us that they are not insurmountable for woman, show us still further, that we may not make our horticultural training one-sided, but that in teaching how to care for and beautify the land, we may also teach the little woman to care for and render cheerful, healthful, and happy her home and all its surroundings.

And if this education must — as it now seems in very many cases that it must — be obtained elsewhere than at her home, may she then go back to her home, however humble it be, as a ray of sunshine; a faithful, loving, capable daughter, there to remain till some one shall win her away to be the light of a new home.

Discussion.

Mrs. Ednah D. Cheney was called on by the Chair, and said that the meeting recalled to her mind the one held under the auspices of this Society and in this very room, with the venerable Ex-President Wilder present, for the purpose of promoting the horticultural education of women. It was then hoped that the

Society might take such a school directly under its auspices. The meeting referred to resulted in the establishment, by private subscription, for very much the same reasons as had been suggested by the essayist, of a horticultural school for women. An estate was hired in Newton, and Mr. Charles Barnard was appointed principal of the school. The greatest lack of the school was pupils, the largest number at any time being twelve, although the school had a fund of $5,000 to give assistance to those who needed. The same difficulty has been found in obtaining pupils for horticultural schools for boys, and indeed at all industrial schools; and here the further disadvantage was felt of its being a new thing. The school was not made too public lest it should attract those who had no earnest purpose. One of the pupils afterwards had a greenhouse in Brookline. Last year the trust was given up, and the funds were transferred by authority of the Legislature to the Institute of Technology to found the Joy Scholarship for women, the income going to help needy girls who study there. The speaker considered that the time had not arrived for special horticultural schools, but that they must be preceded by a general training in science. When the Bussey Institution was opened, with classes in horticulture for both sexes, this school was closed. Every effort was made to induce young women to attend, but it met with very little success. Neither do young men come to the Bussey Institution; there are now only three pupils there. A few ladies who wished to learn about the culture of house plants have attended the lectures. Under these circumstances the Directors of the School of Horticulture for Women did not think it best to appeal to the Legislature or the public for further funds, and as before mentioned the school was closed. The committee having charge of the fund had very little opportunity to expend the income in aiding pupils at the Bussey Institution, as no one applied for entrance there. Professor Watson said that a boy would not be much more valuable in a greenhouse for having attended the Bussey School.

Leverett M. Chase, Master of the Dudley School, District of Roxbury, considered the subject one of the most important discussed by the Society. In his long and wide experience he had become acquainted with a multitude of mothers, and he was filled with anxiety as he saw so many living in a kind of social bondage—a life almost purely artificial and useless. With very many, rubies

are better than wisdom, and it is better to dwell in the tents of wickedness than to be a "doorkeeper in the house of the Lord."

To meet the demands of fashion, children are sacrificed, health destroyed, homes made wretched, useful knowledge neglected; in short, all that tends to the highest physical, moral, and mental development is almost ignored. The dominant tendency of city life is to make poor wives and mothers, and it is axiomatic that without good wives and mothers there cannot be happy homes; and thus the public virtue is sapped and eventually destroyed.

Most of the avenues of self-supporting labor are closed by the edict of Mrs. Grundy. Many women drag out a hand-to-mouth existence in some employment called genteel, and are sore beset by the temptation to accept the friendship and help of those enormous brutes that lie in wait, devoting their time and energies and finding their highest enjoyment in destroying those unfortunates whose environments or whose lack of resisting power render them victims to a fate far worse than immediate death.

The present style of living in our cities and suburban towns is so costly as to preclude marriage, in many cases; an evil prolific in most serious results. He had long felt that woman has a great work and opportunity in floriculture and horticulture; a work that will afford excellent remuneration and is altogether better than many occupations now over thronged with working women. In the West, where customs and prejudices are less inveterate than in the East, women have achieved great successes as keepers of greenhouses, cultivators of small fruits, poulterers, vineyardists, and in many other fields of labor peculiarly adapted to their capacity. When in California a few years ago, the speaker visited the Fresno raisin vineyards, many of them owned and cultivated by women who had entered upon this work in poor health but had found health, competence, and happiness in this delightful occupation. In several cases he found women whose net profits were more than two thousand dollars per annum.

He would be glad to see thousands of our women, now barely able to earn enough to keep soul and body together, whose only earthly future is incessant toil unsweetened by hope, unrelieved by even a sight of the "divine face of mother Nature," delivered from the house of bondage and "go forth under the open sky."

Mrs. H. L. T. Wolcott had thought this Society ought to do more for children by offering prizes for flowers grown by them.

When she worked in her own greenhouse her gardener said that all women were not like her; his wife could not do what the speaker did. Florists do not even educate their own children to follow their business. Agricultural colleges come in contact with the farmers, and their daughters might be benefited by attending them. In the freer western part of our country they are doing more for the education of women in agriculture than here. At the Iowa Agricultural College the girls are trained in a regular course of domestic economy; each girl has to be one of a class who for three months at a time do all the house work of the institution under the direction of the matron. They are also taught the regular course of study in botany, chemistry, etc. While the speaker felt the great importance of such an education she did not believe we can do much toward promoting it in this State, unless we can appeal to the Agricultural College to undertake it. The tendency here is to place girls where they can bring in cash wages as soon as possible.

Rev. A. B. Muzzey had hoped we should hear more from the ladies. He was surprised to see so many sharp lines between the work of man and woman, and glad to see the waves washing them away. In Eden Adam and Eve worked together, but somehow they are parted now. The theory of the essay is good, and he hoped something would come of it practically. Almost every one in this room believes there is something radically wrong in the education of young women. Marriage has been considered a matter of course, and the question has been what could be done meanwhile. Our school committees are besieged by the daughters of farmers and others who desire positions as teachers. What is the cause? Formerly farmers' daughters engaged in domestic labor, and the change and loss has been brought about by a false conception of the dignity of labor. It was thought that the foreign population came in very well as substitutes for the daughters of the house in domestic duties. The idea that labor is degrading is anti-Christian and anti-republican. There is a dignity in labor; and until the community is educated to recognize this fact it will be fruitless to open the doors of the Bussey Institution and similar schools and expect students. He was rejoiced to hear the essay, which was conceived in a broad, true, and liberal spirit. There is nothing degrading in labor; on the contrary it is elevating. But it is of no use to establish schools faster than you can find pupils to fill them.

William C. Strong said he felt jealous for the reputation of this Society. The burden of providing horticultural education for women seemed to be laid upon it by the essayist, and one of the speakers had gone further and passed a criticism on the Society for neglecting it. Many of the lady members of this Society are engaged in floriculture, and are on an equality with others, and what more can we do? The agricultural college itself is but an experiment, and it is doubtful whether a special school of horticulture would be wise, particularly if confined to women. All present would agree with those who had expressed such noble sentiments in regard to labor.

Miss Smith said the mistake had been made that girls in studying horticulture had looked forward to making money by gardening. The school of horticulture should be combined with a school for home culture. She had found many large farms without gardens or poultry, and the daughters away. They could certainly be taught to care for poultry.

Mrs. Cheney thought making money the most important point of all to make women's work practical and not amateurish or superficial. Painters do not consider themselves entitled to be called artists until they can sell a picture. Girls must either earn money themselves or spend money earned by some one else. She knew a family in Vermont where the father is breaking down and there is an invalid girl. There are two other daughters who thought that if they could take hold on the farm they might keep the family together, but they are considering the choice between that and going into a store. If they had begun to consider that question ten years ago they might be ready to meet it now.

Edward L. Beard said that behind the question under discussion is a lack of a general knowledge and love of horticulture. We need not go far away to find a complete ignorance of the subject. We must build on the broader base of an effort to supply this deficiency. This Society has an opportunity to do much for the cultivation of a taste for horticulture. If we could put into all our towns and villages local horticultural societies to cultivate the taste of the communities it would be a great help. Without this practical horticultural knowledge, horticultural schools for women will be of little benefit. If this Society should formulate some such effort in ten years we should see the effect.

Mrs. Wolcott spoke of the effort made in 1878 to encourage

window gardening among children. The money for prizes and other expenses was contributed by a generous lady. The churches were called on to give plants on Easter Sunday for this purpose, instead of flowers; and plants were procured from other sources. All that was asked of the Society was a little start in the experiment. Exhibitions were held in the hall through the summer, and those who had initiated and watched over the movement felt much encouraged by the interest manifested. It was hoped that it might be continued by the Society, but this hope was not realized. The specimens shown by the children were not as good as those that usually grace our tables, and perhaps some of the members feared that the plants might be attributed to them.

The Secretary stated that the reason why the Society did not do what was hoped for in this direction was that at that time the financial situation would not admit of it.

Mrs. E. M. Gill thought mothers lacked energy in training their children to work, and were to blame for not giving them more sensible ideas of life and its duties. They lack the love and the will for work. She has two daughters who are now teachers but when at home they do the house work. She became a member of the Society in 1865, and has been absent hardly a Saturday since that time, and has had her share of the prizes. She enjoys her horticultural work and the money it brings. She can go to ride with her own horse, and feed him, and wash the carriage. She did not think many men, if they employed women in their greenhouses, would insist on their working until midnight.

C. M. Hovey said the object advocated in the essay is one which the Society ought to do all it can to promote, though perhaps it will be difficult for it to do anything directly. He had himself done much for this object indirectly, contributing to the exhibitions of the Society in its early days more than now when the prizes are large. He remarked on the small number of young men to be seen at our meetings, and hoped to see more of them. After all that has been said we come back to the simple fact that girls do not like to work in the garden any more than they do in the house. He feared that false ideas of respectability would long interfere with making garden work popular with women. In Philadelphia women are employed in greenhouses much more than here. While in France he visited a florist friend, and after dinner a man brought in a pan of plants and they sat conversing for two hours, the lady

of the house being all the time engaged in pricking out these little plants. There is a good deal of hard work in out-door gardening; and our climate is rather severe for women to endure labor out-doors; it is very hot in summer and very cold in winter, and one must be rugged to thrive working out-doors in it. Many of the hands employed in a garden, whether men or women, must be discharged in autumn. He had found it hard to get girls to pick strawberries; but he knew one lady, now the wife of a wealthy gentleman, who received the first money she ever earned for picking strawberries. We must begin at the bottom and try to make labor respectable. If we can in some way raise the dignity and respectability of labor it will be a great point gained. He had found that when his children went to school they had as much as they could do without engaging in horticulture.

Miss Smith asked whether garden work is harder than playing lawn tennis.

Mr. Hovey replied that spading is a good deal harder. It is not pleasant for either men or women to go out to the greenhouses at midnight with the snow three feet deep, the mercury at twenty degrees below zero, and the wind blowing a blizzard, to see that the furnace fires are all right. There is some light work in gardening, but much hard work.

Mrs. Wolcott said she had taken care of a greenhouse and raised grapes and sold them, and the work was not to be compared for difficulty to the burdensome work all day in a cellar kitchen.

John B. Moore said that he belonged to the class of farmers, and was thankful that he did. The wives of wealthy men make furnace fires more than farmers' wives. In Concord, where he lives, a farm without a flower garden is an exception, and the women take care of the flowers. The statements which had been made concerning the hard lot of farmers' daughters touched him in a tender place; their lot is not as hard as it has been painted.

President Walcott said it must be remembered that Concord had long had the benefit of a horticultural institution in the person of Mr. Moore.

The announcement for the next Saturday was a paper on "Ornamental Climbing Plants, and How to Use Them," by John G. Barker, Superintendent of Forest Hills Cemetery.

BUSINESS MEETING.

SATURDAY, February 5, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the Chair.

Mrs. H. L. T. Wolcott referred to the Prizes for Window Gardening offered in 1878, and expressed a desire that another attempt might be made for its encouragement. On motion of John B. Moore, seconded by William C. Strong, the Executive Committee were requested to consider the best method of encouraging Window Gardening among children under eighteen years of age.

The Secretary read the following letter from M. Charles Joly, Vice-President of the Société Nationale d' Horticulture de France, and a Corresponding Member of this Society:

PARIS, January 11, 1887.

ROBERT MANNING, ESQ.,

Secretary of the Massachusetts Horticultural Society:

Dear Sir,—I have received, through Mr. E. B. Wilder, the official account of the burial of our most esteemed friend, Hon. Marshall P. Wilder. The news of his death you had already given to me in your last letter.

I beg to send to you and to your Society the expression of our deep regrets for the loss of your great and most worthy Ex-President. Such a man reflects the highest credit on your country and your Society. Be assured that we take the greatest interest in the loss that your company and the horticultural world has sustained.

Yours most respectfully,

CHS. JOLY,
Of the Paris National Horticultural Society.

FRANK WHEELER, of Concord, and
GEORGE B. GILL, of Medford,

having been recommended by the Executive Committee, were on ballot duly elected members of the Society.

Adjourned to Saturday, February 12.

MEETING FOR DISCUSSION.

Ornamental Climbing Plants, and How to Use Them.

By John G. Barker, Jamaica Plain.

The cultivation of climbing plants has never yet been taken up and made a special subject of in our meetings here, but I have been requested by the Committee to do so at this time; and if, in my presentation of the subject, for the sake of completeness I here repeat some things you may have heard me say before, I hope their repetition may not be considered out of place.

I remark, first of all, that many of us have failed to cultivate climbing plants to the extent they deserve; and although we must admit that there are indications of a growing interest in them still the many places where climbing plants can be used, and are not, are earnest invitations to us to consider where and how we can plant them.

A short time ago it was my privilege to visit a very nice place where there is a very handsome conservatory; and the sight of a few climbing plants there cultivated led me to ask, Why not have more of them? Here are height and light, leaving no occasion to plant so thickly that the climbers will be detrimental to the plants below them. On the other hand they would be preëminently appropriate; and not only in the place above referred to, but in many conservatories and greenhouses well known to us all; and if used they would add a new charm to many such places; being attractive objects, whether trained against the wall or up the rafters and allowed to hang in festoons.

Let us now look at some of these climbing plants adapted to conservatory and greenhouse purposes. We shall find them to be, nearly all of them, old and tried friends; let me again introduce them to your attention. Go with me, if you please, to the large conservatory on the estate of Samuel R. Payson, at Belmont; and as you enter your eye will at once rest upon as fine a specimen of *Rhynchospermum jasminioides* as any of us perhaps ever knew. It occupies a large space — the size I will not pretend to give. The beautiful foliage is in itself of sufficient value to entitle it to a place in any large conservatory or greenhouse; and when you add to this its profuse flowering qualities, the blooms being pure white,

very fragrant, and produced in clusters, we find it valuable not only for decoration, but also for the bouquet maker. It will do well in the conservatory or the warmer house for stove plants. If not at the head it is certainly one of the best of greenhouse climbers. My little experience with it says good turfy loam, with leaf-mould and a good sprinkling of silver sand, is what suits it best to grow in.

I have seen those two magnificent climbers, *Lapageria rosea* and the variety *alba*, pictured as growing together; in fact, if my memory serves me right, I have seen them planted together at Mr. Hovey's. I do not blame any one for going into raptures over them; I cannot describe their beauty. I have had no practical experience with them, but I have seen and I love them. I have read in one place of the white variety, beautifully ornamenting a wall and then stretching across the house on a strong cord, about four feet from the roof and ten feet from the ground, the shoots being allowed to hang gracefully down; while on the opposite side was a plant of the old crimson kind, which met and mingled with the shoots of the white one. The effect of the mixture of the different colored flowers was, as may be readily supposed, very charming. Their beauty is not fully seen when the plants are stiffly trained against the back wall; the shoots should be allowed to hang down freely.

The cultivation that ensures success, as nearly as I can ascertain, comprises, first of all, good drainage; this is very essential. The drainage material should be covered with a thin layer of fresh moss. The compost should consist of the best fibrous peat with plenty of charcoal and sand, and in the growing and flowering season the plants should have copious supplies of water. They must be constantly well syringed to keep off insects. Look out well for the sow bugs, which are very fond of the young shoots. The beauty of these lovely plants is that they can be grown to the best advantage in a cool conservatory or greenhouse — better than in any other place.

Clematis indivisa is a good cool greenhouse climber, and can be trained to the rafters; the branches, which are thickly studded with flowers of a star-like shape and pure white, being allowed to droop down.

Tacsonia Van Volxemii is also a very handsome, fast-growing plant, and is seldom out of bloom. Train the principal stems to the rafters, and allow the young shoots to depend from them, and

their lovely flowers will show to the best advantage. This plant should be in every collection; its flowers are crimson, borne on thread-like stems, varying from nine to fifteen inches in length; and when it is said that they occur at nearly all the joints some idea can be had of its great attractiveness.

Bignonia venusta is a splendid old plant, well known to many and deserving a place wherever the space can be spared; if trained to the rafters, the drooping racemes of its beautiful large tubular-shaped amber colored flowers will form a display of floral beauty more attractive than it is easy to conceive of. I remember one in the greenhouse of an old friend in Philadelphia, trained to a post and then along the ridge-pole of his greenhouse sixty feet or more. He used the flowers for making designs, etc., and, in his own words, it was "one of his stand-bys." It will grow in any good soil. I think the best place is a good border inside the house; indeed I know of a plant in a greenhouse, not a dozen miles from here, and I am sure the soil has not been renewed in as many years; still it does well.

Mandevillea suaveolens is a grand climber, but it is susceptible to the attacks of the red spider; and the syringe must be used freely. It is very ornamental; if it grows too rapidly, the weak shoots may be thinned out. The blossoms are pure white, not unlike those of the Dipladenia in shape; and are so fragrant that it is sometimes called Chili Jasmine. If this were only hardy and you could persuade it to grow with *Clematis Jackmanni* and flower at the same time, could one imagine anything more grand?

Let me ask your attention to the Passifloras. Their habit is robust and free growing, and they are adapted for running over the roofs of their respective habitations. *Passiflora cœrulea*, the flowers of which are white and blue, is perhaps the best known and the most generally cultivated species; and deservedly so.

The fruit of some species, such as *edulis*, *laurifolia*, and *quadrangularis*, is eaten; the fragrant, succulent pulp which surrounds the seed is found to be cooling and pleasant, agreeably acid, and admirably adapted for allaying thirst in hot climates. At the greenhouses of the late Edward S. Rand, Sr., in Dedham, the writer well remembers seeing *P. edulis* and *P. quadrangularis* grown in large pots; and that they flowered and fruited quite freely. I will not specify any more of the varieties. All are of easy culture; liable, I know, to the mealy bug, but with a bottle of

alcohol and a small camel's-hair brush you can soon clean them out. A little occasional labor devoted to looking after these pests pays well.

Some perhaps will ask, What about *Stephanotis floribunda?* I well remember in the greenhouses of the late Mrs. Ward, at Canton, when under the care of Joseph Clark, that he had two balloon trellises on the upright posts that support the roof of the greenhouse, and if I remember rightly there were plants of Stephanotis set in places under the stage prepared for their reception; they were carried straight until they reached the frames, and were then trained around and around until each frame was covered. These were indeed beautiful specimens, as some present may remember, and by careful management in the resting and growing seasons were so developed that I think nothing of the kind could equal them. The Stephanotis, if allowed, will cover a large space and produce a great abundance of flowers. But I hear some one saying, "I don't want the dirty things." Well, I know they will get dirty; so will you if you don't clean up pretty often; but they are not so hard to care for as you think. When the plants are not in flower, if dirty, take the syringe or hose and bring a stream to bear upon the plant with force enough to dislodge the insects, this is easy, try it; with the use of the sponge too many buds are dislodged and you lose a good deal of bloom.

What shall we do with the Bougainvillæas? If I had a greenhouse with a back wall to it like Col. Wilder's I should certainly have one. I do not recollect whether his was *glabra* or *spectabilis*, but I think *glabra*. Perhaps a brisk temperature may be best to grow it in, and that followed by a season of rest; and if I rightly understand about the ripened shoots these are pruned to short spurs in the early part of the year, and from these spurs the beautiful bracts are produced. I have seen the plant referred to when it formed a mass of the loveliest coloring — easier to be appreciated when seen than to describe; for I hardly see how the best description possible could do it justice.

We will take a glance at the Allamandas. *A. cathartica* is one of the oldest species, and the best adapted of any for a pillar or for training up the rafters. The flowers are bright yellow, and are produced very abundantly for months. There are several other species, but none as well suited for climbing as this.

I need only to call your attention to the Roses; their value is

well known, and many here can speak of them more instructively than I can, with my limited experience. While in Cambridge I tried to grow grapes in the greenhouse, but the success was not satisfactory; finally they were removed, and I planted a rose bush to take the place of each vine in the old vine border.

The roses were all grafted on the Manetti stock, some five feet high, so as to admit of their being drawn through the old holes where the vines had been, and reach the wires on which they were to run. This border was entirely outside; I always covered it sufficiently to keep out the frost, and allowed the plants to rest as long as they would, which was generally till the latter part of March, when the sun was getting higher each day. This plan proved very satisfactory. The varieties were Maréchal Niel, Bon Silène, Safrano, Lamarque, and Solfaterre.

Other climbing plants that might be added to this list will undoubtedly suggest themselves to you; so I pass on to spend a short time with the climbing annuals and see what we can find there. Among them are many that are useful and beautiful. A very familiar one to you all is *Cobœa scandens* and *C. scandens variegata;* these will run from fifteen to thirty feet in a season, if the seed is sown in March in gentle heat and transferred to four-inch pots. This method of culture will save several weeks' time in spring.

Maurandyas usually grow about ten feet, and flower in great profusion. I have seen a circle of cedar poles placed in the ground and drawn together at the top with Maurandyas twining over them, which made a handsome centre for a large bed. *Eccremocarpus longiflorus* and *E. scabra* are handsome climbers seldom growing more than six feet; the flowers are orange colored. The plants should be started early in March, in gentle heat.

The Thunbergias are very pretty climbing plants of rapid growth and free blooming qualities. The red spider likes them; but in a shady place, where they get only the morning sun, they will thrive; and a free use of the syringe will be a great help to their growth. I once saw the side of a north piazza covered in this way, and the effect was very handsome.

Tropæolums are well known to you all. I have seen them planted on the top of a steep bank, and when thus placed and well cared for they are very effective, as their bright flowers form a rich contrast with the grass. For trellis work and verandas they are

very useful plants, and their growth being rapid and their flowering qualities so free are recommendations which should give them a place wherever room can be found.

Physianthus albens is one of the very best quick-growing climbers. I remember seeing this plant at the late Mrs. Ward's in Canton several years ago. It was in view as you entered the garden, and was trained to a fence, covering a space of from four to six yards square. Every joint was furnished with a raceme of pure white flowers. I have not seen this plant except in flower; but the large seed vessels are described as quite ornamental, and when ripe bursting and exposing a handful of cottony fibre to which the seeds are attached.

Lophospermum atrosanguineum, *L. scandens*, and *L. erubescens* are all very beautiful, and will grow ten or twelve feet in a season.

Ipomœas are so well known to all that you need only to hear the name to be reminded of the ease with which you can grow them. Have you a veranda that you can train them against? If so, prepare the soil, stretch your strings, and sow them, and when grown they will greet you each morning with their pretty open flowers.

Ipomœa noctiflora is a climber of very rapid growth; it has grown twenty or more feet in a single season. The flowers are pure white, four or five inches in diameter, and as they expand at night have a striking effect. It is also called Evening Glory or Moon Flower. I know of no climber more useful than this.

I will only add the Cypress Vine (*Quamoclit vulgaris*) and Canary-bird flower (*Tropœolum peregrinum*) to those I have already mentioned. But before leaving the climbing annuals let me remind you that they are not appreciated as they should be. They are well adapted for setting around arbors, or training over fences. Strings may be fastened to the top of the fence or building and stretched to pegs driven into the ground; on these strings they will twine in the most graceful manner, and the profusion of their flowers will amply repay the attention you may give them.

I think it probable that the large majority of cultivators will be more interested in the hardy climbing plants than in those already mentioned, as of course more can have them; and I must acknowledge that of late my own taste has inclined very much in this direction. The force of circumstances perhaps contributed as much as anything else towards inducing me to use them — my last

place having a high wall that had to be covered in some way; of which I have taken occasion to speak more than once. As the vines have grown very much in the meantime, I will again call your attention to this covered wall.

I used first of all what is well known to you all as the Virginia Creeper (*Ampelopsis quinquefolia*); properly prepared places were made for the plants about five feet apart, good strong vines were planted at each place, and in four years the wall was well covered to a height varying from ten to eighteen feet. In the fall of the year the foliage, so richly colored in beautiful shades of scarlet and crimson, whether grown by itself or intermingled with green foliage of the trees before changing, is a very conspicuous ornament. But judgment should be used in determining where it is to be planted. It should not be planted with the idea of covering a brick building, for it does not cling close enough — the brick is too smooth. I know a church in Essex County where it had covered the side entirely, and twice to my knowledge it was blown entirely down, and many days' labor were required to replace it.

Here the *Ampelopsis Veitchii* comes in; once started it gives little trouble; indeed, it takes care of itself. We have continual opportunity to notice how handsome it looks on Trinity Church and the many fine residences on the Back Bay. No description is needed to those who have seen it; it describes itself. Let me, however, invite you to Forest Hills Cemetery, where you can see it in unsurpassed beauty on both sides of the entrance; and if you can come but once let it be in the latter part of September. I have no words that can adequately describe the richness of these masses of foliage. That on the south side has been thought to be at all times the richer of the two in the color. Surely among the many good things Japan has given us, we have received in this plant one of our very best climbers. In a conversation which I had with our late beloved friend and associate, Col. Wilder, he repeated a remark made by Mr. Ellwanger — that it was worth coming a thousand miles to see the entrance to Forest Hills Cemetery.

About three years ago *Ampelopsis Veitchii* was planted at the base of a ledge some twenty feet in height, alternately with what is known as the English Ivy. The contrast between the rich changing foliage of the Ampelopsis and the bright green of the Ivy was very effective. I can recall in imagination how it looked as clearly

as when I stood in front of it. I cannot well describe it; but if you have a ledge try this combination, and I am sure it will please you. A few pine boughs were tied over all the ivies in winter, affording all the protection that they required. This was done about Thanksgiving time, and the boughs were removed about the first of April. In this cemetery many fine bowlders are used as memorial stones, in place of monuments, having bronze tablets set in for the inscriptions; these stones are covered with Ampelopsis. It may strike you as odd, but the effect is very pleasing.

We have rambled somewhat from our subject; let us go back again to the wall that I first alluded to. You will remember that it was covered mainly with Virginia Creepers; at a portion of it, *Clematis Jackmanni* and *C. Viticella* was planted and allowed to ramble with the creeper just as they pleased. Now let me ask you to look at these bright flowers peeping out here and there, sometimes singly and then again in larger clusters among the foliage of the Ampelopsis — in the latter part of July and August before the changing of the foliage of the Ampelopsis — and you will see a picture of color not equalled by any artistic bedding combination that you can find.

But the lower part of this wall was bare in many places, for the vitality of the vines was at the top, nearest the sun. What was to be done with it; how should the bare places be made green; or how was it possible to cover them?

Looking to Japan again, I found *Lonicera brachypoda variegata;* widely known and sought on account of its beautiful variegated foliage. Thus very soon the difficulty was met, and the lower part was filled up; indeed we find the Lonicera twining on the stems of the Ampelopsis; and in about three years it was eight and ten feet high.

Another spot occurred not filled up, and here I found a place for *Akebia quinata*, another very useful climber introduced from China; this being of rapid growth soon found its way to the top of the wall. The foliage is delicate and pretty; the flowers, which are produced in clusters, are of a bluish violet color and sweet scented, thus attracting the notice of the passers-by; so I had found another pretty vine to mingle with the Ampelopsis.

Once more I looked about, needing yet another vine. This I found in *Aristolochia Sipho*, perhaps better known as the Dutchman's pipe. Some may say, "What did you want with that; it

will not cling to the wall?" True, but it will twine up the stems of the Ampelopsis, and when it has attained a good size its large heart-shaped leaves afford a charming contrast with the other vines; so that I have been sorry I did not plant many more.

Again: I wanted a vine that would cling to the wall, and this time I had a place for *Bignonia radicans*, which I used to advantage. It was placed in a spot bare until then; but being a true creeper and adhering with great tenacity wherever it can find space, and also a vigorous grower, it soon occupied all the vacant room there was and more. The foliage of this plant appears late in spring, and there is no brilliancy to it in the fall, but the flowers are pleasing, and as you are well aware are borne in large clusters in August and September. Indeed the vine itself eventually showed but little, being covered by the other vines; but its flowers appearing amongst their foliage produced a handsome effect.

I also planted there the climbing Hydrangea (*Schizophragma hydrangeoides*), two years ago. It has endured the two winters without any protection and promises well.

I think we have been long enough at the wall, but I must say that no work that I have done or thought that I have given to any project ever paid better than that.

Now that I have tried to tell you how I covered my wall, let us see if there are not some other vines that you may be interested in, and would like to know about. At a friend's house, trained to a trellis by the side of the front door, is a very luxuriant vine of *Celastrus scandens*, or Bitter-sweet. Either with the flowers, which are small and greenish, produced in raceme-like clusters, or with the orange-colored pods opening and displaying the scarlet covering of the seeds, it is one of our handsomest native climbers. Don't you think this was a good place for it? George B. Emerson says it should be cultivated for its picturesque effect.

Vitis heterophylla is represented in the frontispiece of the "Gardener's Monthly" for 1877, and the following excellent description of this handsome vine is given: "Its great merit in ornamental gardening is not near as well known as it ought to be. The leaves are first green, but when the plant has something to run on and grows vigorously, they are prettily feathered with white. The deep sky-blue berries, towards fall, give it additional attractions. It grows with great rapidity, very soon covering an

arbor or trellis. It is a native of the north of China and Japan, and perfectly hardy here."

I come next to the Glycine, or Wistaria; of which *W. Sinensis* is the species generally cultivated, and the best of all; many a piazza would have had no ornament had it not been for this vine. In Lynn there are many large vines, but for some cause the past three seasons they have flowered but little. I think, however, the secret of success is to keep the growing shoots well pruned in; for by so doing we promote the formation of flower buds. I know of some vines that look little better than so many old stumps when the foliage is off; but they seldom fail of a good show of flowers. I also know of a very large old apple tree, at the base of which two good plants were placed; in ten years the vines covered the tree, and such a picture as was produced by the hundreds of beautiful pendent clusters of flowers was a sight never to be forgotten.

Of Honeysuckles, the best native species are *Lonicera sempervirens* and *L. flava*. These bloom in great profusion during the summer and autumn months. The blossom tubes lie in clusters over the foliage; and in the autumn the abundant scarlet berries are very ornamental. These features entitle them to a place in every garden of any size. The *Lonicera pubescens* is a very vigorous growing species. *L. flexuosa*, the Chinese twining species, is also one of the best.

The Roses must have a place. The Baltimore Belle and Queen of the Prairies are old varieties, I know, but they are good as ever, and if you can find room for them on your trellis or arbor they are worthy of your best care and attention. It will be but a short time after planting before a profusion of flowers will reward you for your care. I am not familiar with any of the newer kinds.

I will just mention a very attractive native vine with fine glossy leaves, *Rhus toxicodendron*; you will know it from the Virginia creeper by its having three leaflets instead of five, with smooth edges. It is attractive, but in my estimation never should be allowed to grow, as it is fearfully poisonous to some people, and an unequivocal nuisance. If you have any children I advise you to extirpate it at once; chop off every piece everywhere, every chance you have.

Actinidia polygama, from Japan, is a vine highly recommended; the foliage luxuriant, flowers white; my experience with a few small plants will not enable me to say any more about it.

I have brought to your notice such varieties of climbing plants as I am somewhat familiar with. Some are like old and tried friends, others to all appearance good but not so well tried, yet promising well. There are many, I am aware, that I have not mentioned. I hope in the discussion which is to follow to hear from you about those.

I think our climbing plants are too much neglected: why, I do not know. Is it because it is difficult to find a place for them? That has not been my reason for many years; surely the greenhouse or garden will afford a place for a climbing plant somewhere, and I am glad to observe that there has been a growing tendency to cultivate them.

Whether they are viewed as trained and elegantly festooned in your window (and this is a part of the subject I have left out entirely) or in the conservatory or on the trellis in front or by the side of your piazza; whether running over and covering some old decayed tree or unsightly stone wall or rock; whether adorning the grounds of the rich merchant or the laborer's humble cottage, or whether their aid is sought in screening your arbor from the rays of the hot summer sun—in any and every one of these cases what class of plants is there which can be regarded with feelings of greater gratification and satisfaction?

In conclusion, I may be permitted to say that not a single wall or fence, especially if viewed from the house, and, I will add, no trunk of any tree if not in vigorous growth—in fact no object whatever, capable or that can be made capable of receiving and supporting a plant, should be left uncovered. The free use of climbing plants always imparts an air of friendship and freedom, no matter where you meet them—on some lofty tree in the woods, the cemetery entrance, or the portico over your door, or in any place wherever they appear.

Our motto is Progress; let the beautiful climbing plants receive a larger share than heretofore of our skill and attention, and I am sure we shall be well repaid for the time spent by their return of beautiful foliage and flower and grateful shade.

Discussion.

William C. Strong was called on and said that he could add but little to what the essayist had said. As the paper was read, he had reflected how wonderful is the variety of vegetable growth.

The tendency has been too much in favor of maples and other stiff upright growing trees, and too few climbing plants have been used. The woodbine or Virginia creeper is beyond question the most beautiful of all vines; he was not ashamed of it in contrast with the English Ivy, though the latter is evergreen. When in England he visited the ruins of Kenilworth Castle, part of which is covered with English ivy and part with woodbine, and he thought the latter the more beautiful and graceful of the two. The Japan Ivy (*Ampelopsis Veitchii*) is far less graceful, but it clings to walls much more strongly than the woodbine, and so has its place for covering buildings of brick or stone. Many climbing shrubs can be trained like weeping trees, with straight stems, drooping from the top. There is a variety of *Vitis riparia* which ought to have more prominence than it has yet had, for the beauty of its foliage; which excels that of any other grape vine, being very deeply cut.

William J. Stewart said that while walking with Jackson Dawson in the Middlesex Fells they saw a wild grape vine with a very deeply cut leaf which they thought highly ornamental and well worthy of cultivation; probably this was the same as the one mentioned by Mr. Strong.

Mr. Barker said that a gentleman had suggested this grape to him as a covering for old trees, but he omitted it hoping that the gentleman would be present to speak of it.

Henry Ross was next called on and said that the best of all the honeysuckles is the *Lonicera Halleana*, which flowers freely, is very fragrant, and the foliage is almost evergreen. *Bignonia atropurpurea* is superior to *B. radicans*; it is perfectly hardy. He admires the *Ampelopsis quinquefolia* above all other vines for its grace, beauty, and hardiness, but it will not cling to walls like *A. Veitchii*. On a wooden house it is much preferable to the latter or to other clinging vines like the Bignonia or English Ivy, but it must be provided with a trellis. For stone or brick walls *A. Veitchii* is better, but it must have protection until it gets established, and even then large patches will sometimes die. It likes a somewhat shady place. There is a house in Newton covered with the Virginia creeper which hangs down five or six feet, and waves most gracefully in the wind. A new species of Ampelopsis, *A. Engelmanni*, has been introduced, which resembles the Virginia creeper in habit, but clings to walls almost as closely as

A. Veitchii. It was found in the woods in Virginia. Mr. Ross spoke of a wistaria, planted at the foot of a hickory tree. which did not grow for four years, but then started and grew to the top of the tree. The wistaria is now about six inches in diameter, and the hickory seven or eight. The former has coiled around the latter and cut into it until the two are apparently one, but the tree continues to bear nuts and the vine to bear flowers.

Warren H. Manning said that there are two quite distinct varieties of *Ampelopsis quinquefolia*; one has grayish bark and the other brownish; one is provided with suckers and the other with tendrils. *Vitis bipinnata* has bluish berries, but is not quite hardy here. *Aristolochia tomentosa* is sometimes sent out by nurserymen instead of *A. Sipho*, which is a much better species. The Menispermum or Moonseed is a very pretty small vine with a roundish leaf. The *Akebia quinata* is one of our best vines, coming out fresh and green in the spring. The Virginia creeper does better at the seashore than any other vine; indeed it does well almost anywhere. He had seen an elm tree in Concord having the stem, which was quite tall, covered with Celastrus, and presenting a very brilliant appearance in winter.

Mr. Barker added to the climbing plants mentioned in the essay the *Bignonia præcox grandiflora.* Plants four feet high had at the end of every shoot a mass of flowers. He had seen *Ampelopsis Engelmanni* growing on a pole taller than a man, and it clung to the bark when that was stripped off. He spoke of the very beautiful effect produced by training the Virginia creeper up the trunks of a row of elm trees at Jamaica Plain, and then across from tree to tree on ropes.

Mr. Strong said that there are several varieties of *Ampelopsis quinquefolia*, one of which has woolly leaves; one has larger leaves than others, and some do not change color in autumn.

Mr. Ross said that at the Arnold Arboretum Mr. Dawson had Virginia creepers with single stems trained to stakes and drooping like a tree, and at Mr. Strong's he saw wistarias trained in this way in flower. Mr. Wood has such a one with a stem nearly six inches in diameter, and it is a very pretty way to grow them.

Mr. Strong said that when trained in this way wistarias ripen more seed than when grown on trellises.

Robert Manning warned those who might desire to cultivate the Actinidia or Celastrus against getting barren plants. The former

produces, on plants with perfect flowers, a fruit of pleasant flavor. He mentioned the Madeira vine (*Boussingaultia baselloides*) as desirable for its fragrance and beauty, but it flowers so late in autumn as barely to escape frost, and therefore it would be better to forward it under glass.

Mr. Ross inquired whether vines bred mosquitoes.

Mr. Barker said that he could not answer the question, but he could say that he lately visited a friend who had no vines but a great many mosquitoes.

Mr. Strong said that he would have all vines on trellises and not directly on the house, though it did not make so much difference with brick or stone houses as with those of wood. Trees also should not be too close to houses.

The Committee on Discussions announced that on the next Saturday M. B. Faxon would read a paper on "Annuals and their Cultivation."

BUSINESS MEETING.

SATURDAY, February 12, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President WILLIAM H. SPOONER in the chair.

President WALCOTT stated that much misapprehension existed in regard to the effort to obtain the use of ground in the Public Garden on which to erect a building for the Society, and read a draft of a letter which he had prepared to be published for the purpose of correcting this misapprehension. It was unanimously voted that the President be authorized to publish the letter.

Adjourned to Saturday, February 19.

MEETING FOR DISCUSSION.

ANNUALS AND THEIR CULTIVATION.

By M. B. FAXON, Boston.

Mr. President, Ladies, and Gentlemen of the Massachusetts Horticultural Society:—

Your Committee on Publication and Discussion has seen fit to call upon me to address you on the subject of Annuals and their

Cultivation. I know very well that I shall tell you little beyond what you already know; but having accepted their kind invitation it only remains for me to bespeak your patience while I tell you what little I have learned pertaining to this subject.

Success in the cultivation of any flower, fruit, or vegetable will be in direct proportion to the care and labor bestowed upon the soil for the reception of the seed or plant. Therefore in the fall, as soon as a few severe frosts have stripped the flower beds of their beauty, I clear the surface of the beds, and thoroughly trench the soil to the depth of twelve inches; eighteen inches would be better, but my soil does not average over twelve inches of loam before a gravelly subsoil is reached. The ground having been thoroughly loosened, well decomposed barn-yard manure is applied at the rate of from twenty to twenty-five cords per acre, and turned under one spade deep. Nothing more is done until spring; when the ground is again trenched as before, and a small quantity of some good chemical fertilizer is spread broadcast. The surface of the beds is then raked smooth and fine, and the preparation of the soil is complete. My largest flower bed is two hundred feet long by sixteen feet wide, and faces the south. At the back of the bed is a high board fence, which shelters the flowers from the north winds; around the sides and front of the bed there is an open lath fence, with gates at convenient distances; and at every twenty feet are division fences six feet in height, to break the force of the wind coming either from the east or from the west.

I have spoken thus minutely about this bed, as on account of its ample protection from the winds I consider it the most desirable bed on my place, and I look to it for my best flowers; and wish to emphasize the desirableness of protection from wind for flower beds. I have never grown a large variety of annuals, but have selected a few such as appeared to me to deserve special attention, and have tried to grow those few varieties to something like perfection, and to this end have devoted the largest part of my leisure hours for the past five years to the cultivation of Asters, Sweet Peas, Tropæolums, and Pansies; and I believe there is a future for these four flowers that will far exceed the expectations of the most enthusiastic cultivator of annuals.

Of course, botanically speaking, Pansies are not strictly Annuals, but since they are largely grown as such, and were allowed by this Society, last season, to form part of an exhibit competing for

the Special Prizes offered for Annuals, I will speak of them today as such. Let us now consider some of the most desirable annuals for general cultivation; and especially the four just mentioned.

The Aster.—I usually make two plantings of Asters, the first about the fifteenth of March, and the second near the beginning of April, in the greenhouse, in shallow boxes. As soon as the plants are well up, I prick them out into thumb pots. From this time until the plants are set in the open ground, where they are to remain, the greatest care is necessary to keep them from becoming spindling; "keep them as cool as possible and still keep them growing" is what I am continually writing my gardener; and if this is done good stocky plants will be the result.

About the fifteenth of May the plants should be set in the open ground; in rows or in beds as the cultivator may prefer, but in either case the plants should be set at least eighteen inches apart. If the weather is dry when the plants are set out, they must be watered until they become thoroughly established in their new position. Keep the soil loose and free from weeds, until the buds begin to set; when all cultivation should cease, and nothing more is necessary until the flowers are ready to gather.

When the plants are about two-thirds grown they should be tied up to stakes; if this be neglected and a heavy storm should happen to come just as they are in full bloom, the plants will be levelled to the ground, and the flowers covered with dirt and spoiled. A bed of asters is in its prime for from eight to ten days, during which time a grander sight is seldom seen, especially before any of the flowers have been cut.

Out of forty or fifty varieties, three classes practically include all the asters grown; these three are Truffaut's Pæony-Flowered Perfection, the Victoria, and the Pompon. Truffaut's Pæony-Flowered Perfection and Victoria are both large asters; the petals of the former incurving to the centre; the petals of the latter recurving to the edge. Pompon Asters have small flowers about the size of a half-dollar.

The following list gives the principal colors afforded by each of the three classes:

Truffaut's Pæony-Flowered Perfection.—Snow white, rose, rose and white, dark rose and white, light carmine and white, carmine, crimson, dark crimson and white, violet, and purple and violet.

Victoria.—White, white tinted with rose, rose and white, carmine rose, crimson, and violet.

Pompon.—White, white and carmine, rose, crimson, crimson and white, and violet.

The above I think include the desirable colors of each class, but there seem to be certain colors which are especially consonant to each class. Thus my best Perfection Asters have been either crimson or purple violet; my best Pompons, crimson or white and carmine; and my best Victorias white or rose. Why this is so I cannot say, but so they have grown with me.

THE SWEET PEA.—I think that I can say without differing in opinion from any one present that the Sweet Pea is the most desirable annual in cultivation. Its delicate fragrance, beautiful form, and variety of coloring make it a favorite with the florist; while its easy culture and long continuance of blooming secure its cultivation in every flower garden.

Sweet peas must be planted as early in the spring as the ground can be worked; the seed should be sown in drills, and covered at least six inches deep. This may be done in two ways. Having prepared the ground and made the drills of the desired depth, we may drop the seed and draw into the drill earth enough to cover the seed two inches deep; as soon as the plants appear through this covering, draw into the drill two inches more earth; and so on until the drill has been filled up even with the surface of the ground. Or, secondly, the seed may be dropped and covered in the usual manner, at a single operation.

The surface of the ground sometimes becomes hard just as the young plants are about to appear; especially so after a shower followed by a hot sun. Unless some means is taken to prevent this, a great many of the young plants will fail to break through the soil, and no more will be seen of them than if the seed had not germinated at all; and those annoying "gaps" will appear in the rows. A slight raking just as the plants are breaking ground will prevent this, and also kill any small weeds that may have started.

The most laborious task in the cultivation of sweet peas is bushing them; and bushed they must be almost as soon as they are well up. Having an unlimited supply of white birch at hand I use birch brush for bushing the sweet pea, the same as for tall growing garden varieties. Wire hen netting makes a very desirable trellis for them to run upon, and is very neat. Whatever they are trained upon must be very firmly secured in position, as the vines

when fully grown will surely be blown down unless very strongly supported.

Another very desirable mode of cultivation is to begin by placing the row of birch brush, or whatever the vines are to climb upon, in position before the peas are planted; then plant two rows of seed, one row on each side, about four inches from the brush stems or trellis wires. As the vines attain their growth their supports will be entirely hidden from view and a beautiful wall of flowers will be the result.

The following are standard varieties and should be in every collection:

Painted Lady, a beautiful rose and white.
Crown Princess of Prussia, a delicate light rose.
Scarlet Invincible, bright scarlet crimson.
White, pure white.
Purple, dark purple.
Black Invincible, the darkest variety grown.

The following named sorts are of recent introduction and have not as yet been sufficiently tested to warrant placing them among the standard varieties — although some of them are very promising.

Princess Beatrice.—Color beautiful carmine rose; an early and continuous bloomer, with extra large petals. It holds its beautiful color until frost; and if it proves as desirable during the next few seasons as it now appears it will without doubt take the place of Crown Princess of Prussia; for it cannot be denied that the latter fails to hold its color.

I give the introducers' descriptions of the following:

Cardinal.—A splendid robust growing variety, producing a great profusion of bright shining crimson scarlet flowers, very distinct and handsome.

Indigo King.—The standard of this charming variety is of a dark maroon purple, with clear indigo blue wings.

Princess of Wales.—A lovely variety, shaded and striped with mauve on a white ground in a most pleasing manner; the flowers are of great substance and perfect shape. It has been awarded a First Class Certificate by the Floral Committee of the Royal Horticultural Society, London.

Vesuvius.—A new large flowered variety, very fragrant. Upper petals brilliant rose, shading to a deeper hue, and spotted carmine; lower petals violet shaded lilac.

Bronze Prince.—A magnificent variety, with well formed flowers; the standard is of a rich shining bronze maroon; the wings are of a deep bright purple color.

Lottie Eckford.—This charming variety is in striking contrast to the preceding, the standard being white suffused with purple, and the wings, which are also white, having a pretty edging of blue.

Butterfly.—Pure white ground, delicately laced with lavender blue.

The above list I think embraces the most desirable of the newer varieties, although only a few of them. Five still newer candidates for favor have been brought forward this past season, and will be grown next summer for the first time; they are

Duchess of Edinburgh.—Standard light scarlet, flushed with crimson, slightly marbled or splashed at the edge with creamy white; wings deep rose.

Imperial Blue.—Wings bright blue, slightly shaded with mauve; the standard being rich purplish crimson.

Isa Eckford.—Flowers of a beautiful creamy white, heavily suffused with rosy pink.

Orange Prince.—Described as follows: "The most distinct variety ever sent out, and one that has been awarded a First Class Certificate by the Royal Horticultural Society, London. The standard is bright orange pink, flushed with scarlet; wings bright rose veined with pink; extremely handsome."

The Queen.—A very beautiful and pleasing variety; the light, rosy pink standard being in charming contrast to the wings, which are light mauve.

The introducer of the above new varieties writes of them as follows: "The new sorts are all very distinct, and of unusual excellence, the flowers extremely pretty, and of the most charming and varied colors. They cannot fail to please, and can be highly recommended."

Before leaving this branch of my subject allow me to state what I believe to be the "key note" of successful sweet pea culture; which, in nine seasons out of ten, will give success. It is short and easily remembered:—*Plant early and plant deep.*

THE PANSY.—Since we are about to discuss the cultivation of the Pansy as an annual, the first question that presents itself to our minds is, What strain of seed shall we plant? and this question brings up another, What are the properties of a perfect flower?

Substance of petal is the most important point. However perfect may be the form, however beautiful the color or large the flower — if it is weak and flimsy its beauty is destroyed. The petals must be thick and velvety, a condition which will enable the flowers to keep well after being gathered.

The second point is Form. The petals must be so disposed as to form almost a perfect circle, yet I think the two upper petals should be a little longer than the others, so as to just break the circle. The margin must be smooth and the petals perfectly flat; not turning up at the edges, which defect spoils a great many flowers otherwise perfect.

The next requirement which demands our attention relates to Color. Whatever the color, it should be clear and pure; with the eye large and distinct.

Lastly comes Size; of course it is desirable to have good sized flowers, but size is the least important point of a good pansy.

I believe judges usually adopt the following scale of points:— form, four points; substance, three; color, two; and size, one; if I were to attempt to improve upon this scale, I should say, Give to substance four points, or perhaps even five; and let us have some good, heavy, velvety pansies.

Referring to my diary I find March 10 has been the average date for planting pansy seed; and May 20 for setting the plants in the open ground. The young plants are treated in the same way as the asters, and are transplanted into beds as soon as the ground becomes dry and warm. The beds are prepared for the reception of these plants as previously described; except that thoroughly rotted cow dung is the only manure used; horse manure should be avoided. Set the plants two feet apart each way, and water thoroughly in dry weather. Almost as soon as the plants have become established in their new position, they will begin to bloom; and unless they are closely watched, and all the buds are picked off as they form, the plants will exhaust themselves in producing a few very inferior flowers, and grow very spindlingly.

From the day that the plants are transplanted into the open

ground the beds should be examined every morning; every visible bud should be pinched off and every long shoot shortened, the object in view being to obtain large stocky plants, full of vitality. If this matter is attended to regularly it will only take a few minutes each day; but if neglected even for a day, and the day be a warm one, some of the plants will be sure to flower; which will weaken them and partly undo our previous work.

If the plants are thus kept from flowering until cool weather, and then allowed to bloom, the flowers will be of good substance and large size. I do not wish this to be taken as implying that I ever consider the size of the flowers in any different light from that mentioned in my scale of points; but this keeping-back process will make large and at the same time heavy and velvety flowers.

After the first of September the flowers of almost all other annuals begin to grow poor and the first frost practically ends their flowering. But the pansy seems rather to improve than otherwise by any frost that we usually have in September; and it is from the first of that month until the middle of October that a bed of pansies grown as described is in its prime; a time when flowers of all kinds are, I believe, rather scarce. Last fall, after every other flower in my garden had been spoiled by frost, my pansy bed remained for a month in full bloom, covered with an abundance of the most beautiful flowers.

THE TROPÆOLUM.—Of this extensive genus, including with hardy annuals also greenhouse and herbaceous perennials, three of the annual species chiefly attract our attention; these are

Tropæolum majus (Tall Nasturtium).—A well known running species, much used for covering trellises and rustic work.

Tropæolum minus (Dwarf Nasturtium).—A dwarf species, growing from one foot to fifteen inches in height, and one of the most useful flowers we have; for its compact growth and rich colored blossoms render it an excellent bedding plant.

Tropæolum Lobbianum.—A running species: which may be grown on a trellis, or as a dwarf if the ends of the vines are closely pinched off, otherwise it will cover unnecessary space. The flowers are smaller and more cup-shaped than those of the two preceding species; and are of very brilliant colors.

As regards the culture of the Tropæolum I have hardly anything to say, it is so easily grown. All that seems necessary is to plant the seed in good rich soil, see that the plants have plenty of room in which to grow, and keep the soil thoroughly stirred.

I see by the clock that I have used up my allotted time, and yet have only opened this subject of Annuals and Their Cultivation, but if anything that I have said shall help to extend the cultivation of this beautiful class of flowers, I shall be more than pleased.

Discussion.

Henry Ross was called on by the Chairman, and said that he had not taken half the interest in annuals that he wished he had, and he meant to do differently in future. He mentioned the Dwarf Antirrhinum, or Snapdragon, as a most beautiful annual. The Dwarf Sweet Alyssum and Petunia are also desirable. He means in future to grow his verbenas from seed for they have been brought to such perfection that we are pretty sure to get good ones, and seedling plants are not diseased like those raised from cuttings. Petunias raised from good strains make one of the most beautiful shows in the flower garden. At Forest Hills Cemetery a large part of the floral decoration is composed of annuals.

John G. Barker thought we had all been remiss in looking after the cultivation of annuals. He spoke of a visit of the Garden Committee to the garden of a lady at Hopedale, which took the prize for the best flower garden. Annuals were extensively used here with beautiful effect. There was one bed composed of *Phlox Drummondi* and asters of different colors, with a border of Ageratum, which was particularly beautiful; he had never seen a bed of foliage or flowering plants more ornamental. Almost all the work in this garden was done by the lady and members of her household. He wished more ladies would devote themselves to growing annuals; they could easily do it. He had been through the seedsmen's catalogues pretty thoroughly to find the best kinds of annuals. For mixed beds at Forest Hills Cemetery, of which he is Superintendent, he has to make careful preparation in order to meet the wants of lot owners, there being over three hundred lots which are under perpetual care by the Cemetery. He will have this year four thousand asters; if planted properly nothing will take their place. Antirrhinums are invaluable. The Schizanthus is exceedingly valuable. Sweet peas cannot be used in bedding, but there are places where they are invaluable. *Phlox Drummondi* cannot be dispensed with. Wonderful strides have

been made in the improvement of the Zinnia, until now it is a magnificent autumn flower; we could not get along without it.

It is important in planning mixed beds to study the habits of growth and the colors of the different plants, and to arrange them so as to produce harmonious and pleasing effects. The tall growing kinds should be placed in the rear or centre of the beds, with the lower growing kinds in front. He had seen one border planted against a curbstone sixteen inches high, with tall Phloxes in front and Cupheas behind — exactly the reverse of what should have been.

In regard to pansies, the essayist had said all that was necessary. The speaker sows his seed in September and keeps the plants over the winter in a cold frame for planting in April, so as to have as good a bed as he can by Decoration Day. His experience with verbenas is the same as Mr. Ross's. He makes two or three sowings; the first about this time, and afterwards at intervals of two or three weeks. They flourish best in new soil, and he tries to give them a new place every year. They deserve a prominent position. We have neglected some of the old things too much, and he means this year to have a little garden of annuals on his own account, including mignonette.

The ladies were next called on. Miss S. W. Story approved especially of the Schizanthus. Last year she cultivated in the greenhouse a species of Cosmos, a comparatively new annual resembling the single dahlia.

Mrs. E. M. Gill said that last year she grew three thousand pansies. She sows the seed in August and September and transplants as she gets time, covering them with glass from October to the last of March. She uses fresh cow manure for them successfully. Seedling verbenas are not only freer from disease than those raised from cuttings, but the flowers have more substance. Calendulas and Marigolds are valuable annuals.

Robert T. Jackson said that the season of bloom of marigolds is short, and it is well to have a succession, sowing until the middle of May. Those latest sown will last until frost comes. When it is desired to have double flowers, single ones should not be left in the garden as the bees will carry pollen from them which will cause the double ones to deteriorate. He pulls up all the poor ones.

Mr. Faxon added to the annuals previously mentioned by him

the Dwarf Scabious, Ten-weeks Stocks, and Single Dahlias grown as annuals. He does not think sweet peas need new ground every year; he had grown them on the same ground seven years. In answer to an inquiry he said that as a rule the named varieties come true to name. He imports every year all the new varieties offered. One cannot grow everything and it is better to grow a few things well.

Arthur H. Fewkes mentioned the Salpiglossis, the Single Annual Chrysanthemum, and the small Single Marigold as annuals which should be in every collection. He sows pansies in August and transplants and before winter covers them with brush, and they are ready to flower as soon as the weather is warm enough in spring. By July the flowers are small, and he prunes them in and pinches out the flower buds and they flower abundantly in the fall. The colors of the Salpiglossis are very rich. They are best sown in March, and should first be established in small pots and then planted out in soil suitable for petunias. They do well in his soil, which is rather light and sandy but quite rich. It is well to water them in dry weather. They flower freely all summer.

William H. Badlam asked Mr. Faxon whether he had ever dug a trench twelve or eighteen inches deep and filled the bottom with manure, for sweet peas.

Mr. Faxon replied that he had not done so, but he thought this would be a good way. The sweet pea is a very gross feeder and needs a liberal manuring.

Mr. Badlam said that some of his friends have cast-iron rules; they must always plant sweet peas on Fast Day, and they pursue the plan which he had described, and always succeed.

Mr. Faxon said that they could not do otherwise than well.

Joseph H. Woodford said that for sweet peas he digs a trench two spades deep and fills in with manure and mixes with the soil so as to leave it two or three inches below the surface. On this he sows the seed, covering it an inch, and when the plants are up draws more soil on so that the ground is level when he sticks them. He puts in heavy sticks, as he must to support them. The flowers must be picked every day, or there will be no late ones. The object of all annual plants is to grow, flower, and perfect their seed, and when they are allowed to do the last they die and you get no more flowers. The first flowers of the aster are from the centre of the plant, and they are very fine; and if you

pick these you will get flowers from the side shoots. Pansies are fond of moisture and cool soil, and will bear the highest manuring if the manure is somewhat decomposed. He manures them highly in a trench with the coolest manure he can get. If the weather is very dry he would water with pretty strong liquid manure — not immediately around the plants, but would make holes between them and pour the manure in. He picks them because he wants them, but never lets them mature seed.

Mr. Faxon agreed with Mr. Woodford that it is very necessary to pick off the flowers of annuals as fast as they bloom; it is one great secret of success. If they make a few seed-pods it is too late to stop them. He recommended the Meteor and Prince of Orange calendulas.

It was announced that on the next Saturday W. A. Manda, gardener at the Botanic Garden of Harvard University, would read a paper on "Herbaceous Plants."

BUSINESS MEETING.

SATURDAY, February 19, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The Secretary read a letter from G. B. Brackett, Secretary of the Iowa State Horticultural Society, enclosing the following memorial of the late Hon. Marshall P. Wilder, adopted by that Society at its meeting at Charles City, January 21, 1887:

Whereas, at the close of a useful life of more than fourscore years, during which he has been one of the foremost actors in all the great events of the age, spending more than half a century in the promotion of all that pertains to the art and science of Pomology and Horticulture, the Hon. Marshall P. Wilder has been called to his final rest in the heavenly paradise, by the pure river of the water of life, and beneath the tree of life which yields its twelve manner of fruits every month, and its leaves for the healing of the nations—

Therefore, *Resolved*, That we, the officers and members of the

Iowa State Horticultural Society, while we mourn our loss, will strive to emulate the example he has set us, practice the virtues that ennobled his character, and cherish his memory as one of the most useful and venerable of those engaged in our noble calling.

Resolved, That to him more than to any other is due the credit of placing the art and science of Pomology and Horticulture abreast of the other sciences of our country.

Resolved, That the Secretary be requested to furnish a copy of these resolutions to the American Pomological Society, the Massachusetts Horticultural Society, and the family of the deceased.

G. B. Brackett,
H. W. Lathrop,
J. L. Budd,
} *Committee.*

Adjourned to Saturday, February 26.

MEETING FOR DISCUSSION.

Our Native Plants.

By W. A. Manda, Gardener at the Botanic Garden of Harvard University, Cambridge.

If we consider the large extent of this country, reaching from arctic Alaska to semi-tropical Florida; the high snow-clad mountains, the sloping hills and fertile valleys, the sunny plains and arid deserts, the rich bogs and still or running waters, with all the range and combination of the different climates included within its limits, we must necessarily expect to find a great variety of plants growing in those different natural stations and those various climates. And surely we are not disappointed in this expectation, for within the borders of the United States we find a very great number of species and varieties of plants, and these presenting such diversities of form, stature, and structure that they can be used for almost any ornamental purpose; while many of them are of great economical value.

With them we can plant our avenues, parks, and shrubberies, as well as borders, rockworks, and flower beds; with them we can make our gardens gay, and keep a succession of bloom from the time when the snow leaves the ground until it comes again in the late autumn; and if you have a greenhouse you can stock it either with foliage plants or flowering ones that will blossom the whole win-

ter through; or, by bringing in some of the earlier flowering kinds which force readily, you can enjoy their sweet and delicate vernal blossoms when other plants, in their natural condition, are still in deep slumber, covered with snow.

There is variety enough in store to suit all tastes and requirements, ranging all the way from the largest tree known to the smallest alpine plant, that does not grow above an inch from the ground; from the royal palm to the little modest violet; from plants that grow in water to those that flourish for several months without a drop of rain.

I do not intend to speak from a botanical point of view, for a botanist pays very little attention to the ornamental quality of a plant; he rejoices over the most insignificant weed so long as it is something new, that helps to fill the gaps in the natural system, and connect the plants one with another, as they are naturally related. But I am speaking horticulturally, in a company where plants are appreciated for their showy or fragrant flowers and the freedom with which these are produced; for their beautiful foliage as well as for their hardiness and robust growth; and, as we must take it for granted that, out of the some ten thousand species and varieties of our native plants, more than half are of some horticultural interest, and thus worthy of culture, we must rejoice over this large store of plants that Nature has provided for us; and try by cultivation and hybridization to improve some of the species.

It is self-evident that these native plants must be far better constituted to stand our variable and trying climate than any exotic plants can be. In Europe, and especially in England, these plants, native with us, are cultivated with great zeal and care, and already many varieties have been improved by careful selection, and several remarkable hybrids have been produced by crossing the different species. And so we can but wonder why they are not more cultivated in this country, as they plainly deserve to be.

In attempting to describe some of the best species and varieties, I think it will be proper to mention them not in botanical orders, but in classes, as they are adapted to cultivation; and the first class that claims our attention consists of the

Hardy Herbaceous and Perennial Plants.—Under this head we expect to find such plants as are not shrubby and whose stem generally dies down to the root annually, and whose growth is

continued from the same root for a series of years. In their wild state they are found growing on hills, in valleys, and on plains. They are by far the easiest plants to cultivate, as they will grow in any ordinary soil and situation. Only a very few require any shade whatever; even those that naturally grow in deep and shaded woods can stand the full sun in cultivation and are even more vigorous and floriferous than in their native haunts.

They can be propagated by different methods; the most natural one is that from seed, which should be sown in December or January, in pots or pans, and kept in a cool and dark place until it germinates. The young plants should then be transplanted into a light and cool greenhouse or frame, and subsequently, when large enough to handle, potted singly; and finally, in April, planted out in their proper places.

Plants of this class (except those that have long tapering roots) are also readily propagated by division. This operation should be performed in the autumn; the plants should be carefully cut so that each portion has a few good roots attached; then they should be planted in some light sandy soil in a cool frame, where they should be kept until spring, by which time they will begin to form fresh roots, and if then planted out will grow along without any interruption.

Another way of propagating is by cuttings; these must be taken from the plants just when they begin to grow or after flowering is over; using portions of the soft lateral branches. These cuttings should be inserted in pots or boxes filled with a mixture of sand and leaf-mould, and kept in a cool shaded frame until rooted, when they should be potted singly in three-inch pots, and finally planted out the following spring in the places where they are desired.

The hardiness of these plants cannot be judged by the number of degrees of frost they may endure in the winter, for changeable weather is more trying to them than the hardest frost, especially when the ground is covered with snow. I have observed many plants that stood the winter well, and had begun to grow in the early spring, and were then killed by even a slight frost. A light covering with either evergreen branches or Russia mats will be of great benefit to them; not that it will keep out the frost, but it will simply prevent the sudden thawing and freezing.

Some persons, and especially botanists, will maintain that these plants do not require any special nourishment beside what they

may draw from the soil they are growing in. This may be so in their natural stations, where they grow for years, dropping off a mass of stems and foliage annually which decays and forms the best and most natural nutriment for them. But the case is different in culture in our gardens, where for the sake of cleanliness any decaying leaves or stems are taken from them; and there a dressing of good well rotted manure is very essential to the well-being of this class of plants.

Among our hardy herbaceous and perennial plants we rate the Phlox as one of the best, for with the different species of this showy genus alone we could have flowers at all seasons. *P. subulata* forms a dense mass of rose colored flowers with pink eyes, in the earliest spring. From this species a good many garden varieties have been produced, such as *Nelsoni*, *atropurpurea*, *The Bride*, *nivalis*, and others, varying in the color of their flowers from the darkest purple to snow white. *P. amœna* is another beautiful vernal bloomer; it grows about three inches in height, and produces in May a profusion of purple flowers. Not less valuable is *P. ovata*, which sends up large heads of beautiful purple flowers, on stems from a foot to two feet high, in June. *P. maculata* produces pyramidal spikes of purple flowers; while *P. divaricata* has pretty bluish or lilac flowers on stems a foot high, and blossoms in May. A very neat and compact growing species is *P. glaberrima;* it grows a foot high, has long shiny foliage, and dense heads of pinkish flowers in June and July. *P. reptans* is a dwarf and neat species, never growing over six inches high; it produces large flowers in May. But *P. paniculata* is the best known and most widely cultivated; it grows from two to six feet in height. The type has usually purple (seldom white) flowers, in large and dense pyramidal spikes. Innumerable garden varieties have been produced from this species, presenting all colors from red to white. This species and its varieties flower from July to October.

The Rudbeckia, or Cone Flower, is another very valuable genus; the best species is *R. speciosa*, which grows from one to two feet high and produces a quantity of large flowers, the disk dark purple and the rays orange-yellow; it blooms in July and August. *R. maxima* is very striking on account of its ample glaucous foliage and the very large flowers, with very high black disks, and long yellow rays. It flowers in August. *R. subtomentosa* grows from three to four feet high and produces a large quantity of showy

flowers; the disk is brown and the rays are golden-yellow. Other very good species are *R. grandiflora*, *R. Californica*, and *R. mollis*, all worth cultivating—and more might be named.

Lepachys pinnata resembles somewhat the last named genus; it grows about three feet high, and produces a profusion of flowers in August and September; the disk is light brown and the rays are yellow.

All the hundred species and varieties of Pentstemon are showy, but unfortunately only a few will stand our winters, the genus being made up chiefly by natives of western and south-western states. Among the hardy kinds we have *P. diffusus*, which I consider the best one; it grows from twelve to eighteen inches high, and its large purple flowers are very freely produced from May to August. *P. pubescens* is another good species, with long spikes of pale violet flowers produced in May and June. *P. ovatus* is also worth growing; it flowers in June and July. *P. glaber* is a very showy and compact plant; the stems are a foot high, covered for the most part with very large blue or purple flowers. *P. lævigatus* and the variety *Digitalis* are showy plants, growing to the height of five feet; the flowers are white, in dense spikes. *P. confertus* has also a profusion of lilac flowers, although not very large. *P. barbatus* is one of the best for general culture; the leaves are shining, while the flowers, which are borne on long spikes, are deep red. There are several varieties, the best of which is *Torreyi*, more robust than the type, flowering later, and having darker flowers and larger branching spikes.

Closely allied is the genus Chelone or Turtle Head; of which three species are hardy, *glabra*, with white flowers, and *Lyoni* and *obliqua*, with rose colored flowers.

The Aquilegias, or Columbines, are very showy and deserving plants. I name first *A. chrysantha*, which grows three feet in height, and has long spurred golden flowers. *A. cœrulea* has nearly the same structure, but the sepals are deep blue and the petals white, making it very ornamental. *A. formosa* and *A. truncata* have red flowers, while *A. brevistyla* has dark blue flowers. Not less noteworthy is *A. Canadensis* with its profusion of red flowers in the earliest spring, and although quite common in our woods very ornamental in cultivation. There are two other species, *A. flavescens* and *A. Jonesii*, which are at present very little known. Numerous hybrids of this genus have been produced in cultivation, but none are equal to any of the species.

Out of the several species of Anemone, or Wind Flower, only one, *A. decapetala*, can come into the class now under consideration. It grows a foot high, and has numerous cream colored flowers. The Hepatica, or Liver-leaf, is now classed among the Anemones. The two native species are very neat and compact plants, flowering in the early spring, and sometimes even under the snow. *H. triloba* has flowers varying from blue to white; and *H. acutiloba* pinkish or nearly white.

The Aconitum, or Monkshood, is also worth growing, especially *A. reclinatum*, with white flowers produced on arching stems, and *A. uncinatum* of the same habit but with blue flowers; both are autumn flowers, and thus more valuable, although not so showy as *A. Napellus*, which grows erect, and has very large blue or purple flowers.

Not less valuable is the Delphinium or Larkspur; there are several species with mostly blue flowers. *D. Menziesii*, *D. exaltatum*, *D. azureum*, *D. simplex*, and *D. tricorne* are among the best for ordinary culture.

Under the genus Coreopsis we find also many valuable plants, such as *C. lanceolata*, of very compact and dwarf habit, and producing a multitude of deep yellow flowers. *C. grandiflora*, *C. pubescens*, and *C. auriculata* are all similar to each other in habit, and not unlike *C. lanceolata*. *C. verticillata* grows eighteen inches high, has finely divided leaves, and numerous bright yellow flowers. *C. delphinifolia*, *C. senifolia*, and *C. palmata* are pretty much alike; they grow from one to three feet in height, have rather broad palmately divided or cleft foliage, and ample heads of bright yellow flowers. *C. rosea* is quite distinct, growing only six inches high, and having small rose colored flowers, while again *C. tripteris* may be easily mistaken for a sunflower.

Nearly all of the one hundred and twenty-four species and many varieties of Aster are worth growing, because they flower late in summer and autumn, when flowers are scarce. Especially showy is *A. turbinellus*, with slender stems from two to four feet high, and innumerable pretty violet flowers in October and November. *A. patens*, *A. lævis*, and *A. Shortii* are of similar habit and merit. *A. ptarmicoides* has large trusses of white flowers, on stems eighteen inches long, produced in midsummer. *A. Novæ-Angliæ* is quite showy and more known than any other species. *A. spectabilis*, *A. paludosus*, and *A. surculosus* are all of dwarf habit and have

large heads of violet flowers. Quite remarkable is *A. sericeus*, with silky foliage and lilac flowers. *A. multiflorus* and *A. ericoides* are also valuable, not on account of the size but the great quantity of their white flowers. Other very good species are *grandiflorus*, *diffusus*, *amethystinus*, *versicolor*, *azureus*, *Curtisii*, and *Radula;* and many others could be named.

The genus Solidago, or Golden-rod, includes a great many species which have, with one or two exceptions, all yellow flowers. Among the best ones are *S. Drummondi*, with arching and much branching stems; *S. speciosa*, about three feet high, slightly arching, and bearing large panicles of flowers; *S. Virga-aurea*, which varies in stature according to the locality where it grows; it has a large dense inflorescence, of bright yellow color; *S. rigida*, which grows three or four feet high, the stout stems terminated with dense panicles of large flowers: and *S. sempervirens*, which although common is quite showy, having shining foliage. This genus has seventy-eight species, besides many varieties.

Nearly as large a genus is the Erigeron or Fleabane. *E. bellidifolium* is quite common in our woods, but the western species and especially *salsuginosus*, *speciosus*, and *macranthus* are much more showy. They grow from one to three feet in height and produce numerous and large violet or whitish flowers.

Two species of Œnothera, or Evening Primrose, are notable; *Œ. fruticosa*, a foot high, with several ample yellow flowers, and *Œ. Missouriensis*, of trailing habit and with flowers of great size and beautiful yellow color.

A very pretty plant is *Cunila Mariana* or Dittany; this grows very de se, and produces a large number of purplish flowers in the autumn.

Another very noteworthy plant is *Asclepias tuberosa*, with stems one to two feet high and clusters of deep orange-red flowers. This plant does not like to be disturbed at the root.

Polemonium cœruleum and the white variety are quite showy when in bloom in June and July. *P. reptans*, a vernal species, grows only six inches high, making a mass of light blue flowers in May.

The Hydrophyllums also would be worth cultivating; the plants have either blue or white flowers, in the spring

The Thalictrum, or Meadow-Rue, is quite ornamental; *T. Cornuti* and *T. dioicum* have white and *T. Fendleri* yellow flowers.

The Hibiscus, or Rose-Mallow, is a showy genus, having flowers from four to six inches in diameter. *H. Moscheutos* grows four feet high, and has white or whitish flowers. *H. militaris* has somewhat similar flowers but is more floriferous. *H. grandiflorus* has red flowers.

A very valuable genus is the Baptisia or False Indigo, growing from two to four feet in height and producing large spikes of flowers in early summer. *B. australis* has blue flowers; *B. alba* and *B. bracteata*, white; while *tinctoria*, *perfoliata*, *lanceolata*, *simplicifolia*, *sphærocarpa*, and *microphylla* are yellow; and *villosa* and *leucophæa* have yellow and white flowers.

The Thermopsis is similar to the foregoing. All the six species have yellow flowers and all are worth growing. *T. Caroliniana* is the best of the genus; it grows about four feet high and flowers in June and July. The other species are *Californica*, *fraxinifolia*, *macrophylla*, *montana*, and *mollis*.

The genus Astragalus, with about one hundred and seventy species and varieties, is also horticulturally interesting, but at present they are only known by herbarium specimens, with the exception of *A. Canadensis*, which has yellowish flowers.

The genus Lupinus is also very numerous and most of the species are very ornamental; especially *perennis*, *maritimus*, *Nootkatensis*, *polyphyllus*, and *littoralis*, mostly with blue or purple flowers, but some are white or yellow.

Cassia Marilandica, the Wild Senna, is very ornamental on account of its large spikes of yellow flowers.

Out of the several species of Liatris, or Blazing Star, only *spicata*, *scariosa*, and *pycnostachya* are adapted to general culture. They are very showy, having long spikes of rose or purple flowers.

The Eupatoriums are also very numerous but are not all hardy. *E. purpureum*, with deep purple flowers in large clusters, and *E. altissimum*, *E. perfoliatum*, and *E. ageratoides* are very good plants.

The Boltonia, resembling the Aster but much larger, is a very valuable genus, of three species. *B. asteroides* grows from four to seven feet in height and produces an innumerable quantity of white flowers, while the rare *B. latisquama* is more compact and dwarfer but produces its beautiful lilac flowers with as much freedom as the former; the third, *B. diffusa*, is not much known.

The Monarda, or Horse-Mint, is a genus of showy and sweet-

scented plants, of which *M. fistulosa* has rose colored flowers; while *M. didyma* has deep red and *M. Bradburiana* purplish.

The same may be said of another genus, Pycnanthemum or Basil, which has flowers varying from white to purple, according to the different species.

Physostegia Virginiana grows from twelve to eighteen inches high, bearing spikes of large rose colored flowers.

Some of the Violets may be also mentioned, especially *Viola pedata*, with large lilac-purple flowers; and also the variety *bicolor*, which is much darker and prettier; and the chaste white form, which is occasionally found. *V. cucullata* is also very showy, having ample variegated flowers, but sometimes bearing blooms of unicolor purple or pure white.

Campanula rotundiflora, the Harebell, is a very beautiful plant, growing a foot in height and bearing numerous large flowers varying from the brightest blue to nearly white in color.

Gaillardia aristata is a very neat and showy plant with yellow flowers, but we have now in cultivation *G. grandiflora* and the variety *maxima*, the former with yellow and red, the latter with yellow flowers, very large and showy and produced in great quantity. Both of these are only varieties of *G. aristata*, showing plainly how much a plant can be improved if cultivated for a time, and propagated from seed saved always from the best flowers.

The Echinacea, or Purple Cone-flower, is also very showy on account of the large heads of purple flowers produced by *E. purpurea* and *E. angustifolia*.

For very tall plants we have the Helianthus or Sunflower, of which there are several species, all growing from four to twelve feet in height and having large yellow flowers. *H. rigidus* is the dwarfest, never exceeding four feet in height, and has large showy heads. *H. mollis* grows very compact, four to six feet in height, and produces rather large flowers. *H. lævigatus* grows from five to eight feet high and has numerous pretty flowers, altogether smaller than those of others. *H. decapetalus* has broad leaves and ample flowers. From this species it is surmised that *H. multiflorus* originated; if that be so we have another good proof of how a plant can be improved. *H. multiflorus* has flowers more than twice the size of the supposed type. In cultivation we see mostly the double variety, which is not so showy nor so pretty as the single one. *H. orgyalis* is very striking on account of its

long, narrow leaves and bright yellow flowers. *H. doronicoides* and *H. strumosus* have large and very showy flowers, while for size of the plant we have *H. giganteus*, *H. tuberosus*, and *H. Maximiliani;* all of the last three growing from eight to twelve feet high, and even higher.

Another tall growing genus is the Silphium or Rosin-Plant. There are several species; the most remarkable is *S. laciniatum*, the Compass Plant of the prairies, which is said to have the peculiarity of turning the edges of its lower leaves north and south; but this is not observed in cultivation. This plant grows from six to twelve feet high and has large yellow flowers. Another showy species is *S. perfoliatum* or Cup-Plant; it has square stems, six to eight feet high, and numerous large flowers of deep yellow color. Other very valuable species are *integrifolium*, *terebinthinaceum*, *trifoliatum*, *Asteriscus*, and *asperrimum*, all with yellow flowers, and *albiflorum* with white flowers.

The *Vernonia*, or Iron-weed, grows also from six to ten feet in height, and has large clusters of deep purple flowers. Some of the best species are *Arkansana*, *Noveboracensis*, *altissima*, and *fasciculata*.

An early flowering plant is *Sanguinaria Canadensis* or Bloodroot, with its snow-white blossom.

Waldsteinia fragarioides sends up at the same time a great profusion of yellow flowers.

Geum triflorum also flowers in the early season, and is followed by curious seeds; while *G. radiatum* produces its golden flowers in June.

Linum perenne has very pretty blue flowers.

Hypericum pyramidatum produces large spikes of ample yellow flowers.

Podophyllum peltatum, or Mandrake, has large leaves, and large nodding white flowers in May.

Stylophorum diphyllum, the Celandine Poppy, is also very ornamental, with its large yellow blossoms.

Lobelia syphilitica grows about eighteen inches high and bears large spikes of blue flowers, while *L. splendens* has the same habit, and deep red flowers.

Very ornamental are also the herbaceous species of Spiræa, such as *S. Aruncus* or Goat's Beard, which forms plants three to four feet high, and has large spikes of white flowers; and *S. lobata*,

commonly called Queen of the Prairie; this grows about eighteen inches high, and produces very showy clusters of deep pink flowers. Many other valuable plants belonging to this class should be mentioned, but as this is only a brief review space must be reserved to do justice to other classes.

I must now pass to the

ALPINE AND ROCK PLANTS.— This title will cover plants that may be cultivated out of doors, but which require special situation, soil, and protection. First, we have the Alpine plants proper, or those that are found growing at high altitudes, generally among or upon rocks, exposed to breezes of pure and cool air, and subjected to a perfect rest for more than six months in the year. They are all delicate plants of neat habit, and exceedingly difficult to cultivate, even in our Northern States, on account of the hot summer seasons, while in the South they could not be kept alive, any more than we in the North could keep tropical plants through our severe winters.

The ground for growing these plants must be raised above that surrounding it, and should consist of good light loam mingled with leaf-mould and sand; and in this should be set larger and smaller pieces of sandstone or limestone, so as to imitate as far as possible, on a small scale, the conditions of some mountain regions. It should have a northern exposure; while the south side should have some means of protection against the fierce rays of the sun, but should not by any means be under trees, as these plants require all the light and air they can obtain, although sensitive to the heat. The propagation of these plants is effected in the same ways as recommended for hardy herbaceous plants, but it is a much more difficult and often a disappointing work. Being small and delicate plants, they do not require any manure, beyond a good mulching of well decayed leaves in the autumn.

Covering either with evergreen branches or other light material is necessary to the well being of these plants. This should be done after the ground has frozen somewhat, so as to keep these plants in a perfect and uniform rest; otherwise, if covered too early, the plants may start to grow several times during the winter, and thus exhaust themselves; or they may be liable to damp off.

In the second division of this class we have plants that are not Alpines but for some reason must be grown with them, to ensure

success. Some may grow among rocks or stones, and thus require to be grown like Alpines, but are much easier to grow and propagate; then again we have some plants that are small and delicate, or grow only in certain situations, and therefore cannot be grown successfully under general culture; while others being natives of Southern or Western States are not hardy under ordinary circumstances, but if planted and protected in the same way as Alpine plants they will flourish well, and thus many valuable and showy plants will be added to the list of those for out-door culture in our climate.

Precaution must be taken that no such plants be admitted among alpines as have running rootstocks, which spread with rapidity among the stones, overrunning the more delicate plants; and as it is much more difficult to keep a place clean where these rootstocks have worked in than ordinary ground, it is sometimes necessary, in such cases, to take up the stones and clear up every particle of roots, to get rid of such an intruder.

Among the valuable Alpine and Rock Plants we have the *Anemone alpina*, which grows about a foot high, with very large white flowers; *A. narcissiflora*, eight inches high, with from three to five white flowers on a stem; *A. nemorosa*, a pretty vernal bloomer, with white flowers; *A. multifida*, having small purplish flowers, and *A. patens* var. *Nuttalliana*, which has large purplish and yellow flowers.

Delphinium nudicaule has a tuberous root, grows six inches high, and has red flowers. *D. cardinale* has flowers of the same color, but they are much larger and are produced on branching stems four feet in height.

The genus Saxifraga includes many valuable plants, such as *S. oppositifolia*, of trailing habit, and covered with large purple flowers in the spring, and *S. aizoides*, of a sedum-like habit, and having yellow flowers. *S. cæspitosa* forms large masses of bright green foliage, and white blossoms in early spring; while *S. Aizoon* and *S. flagellaris* form neat rosettes with their thick leaves. The common *S. Virginica* is also showy in the early spring, when it produces great quantities of white flowers.

The little *Thalictrum anemonoides* is very pretty.

Trollius laxus has large pale yellow flowers.

Rhexia Virginica is a very beautiful plant; it grows six inches in height, and has large purple flowers. There are several species of this genus, all worth cultivating.

A very beautiful plant is the *Zauschneria Californica*, which grows over a foot high, and bears numerous red flowers.

The genus *Arnica* is quite interesting, and among the several species we find *alpina*, *foliosa*, *longifolia*, *amplexicaulis*, and *Chamissonis;* all with large bright yellow flowers.

Campanula divaricata is very pretty with its innumerable blue flowers.

The Dodecatheon, or Shooting Star, is a beautiful plant; the only species is *D. Meadia*, with several varieties. It grows a foot high, and produces umbels of showy flowers varying from pure white to the darkest purple.

The Marshallia is a genus of four species, *cæspitosa*, *latifolia*, *lanceolata*, and *angustifolia*, all of dwarf habit, and producing white or rose-colored heads of flowers not unlike those of a Scabiosa.

Quite a valuable plant is the *Spigelia Marilandica*, growing over a foot in height, and bearing large red and yellow flowers in the early summer.

Polemonium humile, more known under the name of *P. Richardsonii*, is a very pretty plant with numerous blue flowers in large spikes.

Hydrophyllum capitatum is pretty on account of its heads of lilac flowers.

Phlox Stellaria is a showy and floriferous plant with light rosy flowers.

The delicate genus Primula, or Primrose, is represented by several very neat species. *P. Mistissinica* grows only four inches high, and has rose colored flowers. *P. farinosa* is a stronger grower, and has flowers of the same color but larger. *P. suffrutescens* has somewhat woody stems, and thick, whitish leaves. The flowers are larger, and of beautiful purple color. The best species is *P. Parryi;* it has large thick leaves, and the stem bears several large flowers which are crimson with bright yellow eyes, thus making it very striking.

Iris verna and *I. cristata* are two beautiful plants.

Not less valuable is the closely allied *Sisyrinchium grandiflorum*, usually with dark purple flowers, but a pure white variety of this is sometimes found.

A very delicate plant is *Eritrichium nanum*, with a profusion of sky-blue flowers.

Cedronella cana has scented foliage, and spikes of purple flowers.

Quite showy is *Uvularia grandiflora*, with yellow bell-shaped flowers, produced in great abundance in the early spring.

Solanum Torreyi is a rare and beautiful plant two feet in height with large violet flowers.

Ipomœa leptophylla has a very large tapering root, stout trailing stems, and large pink flowers.

The genus Mertensia or Lungwort is represented by seven species, all very beautiful plants, with clusters of purple or blue flowers. One of the best and also the most known is *M. Virginica* with purple flowers; but *M. paniculata*, *M. oblongifolia*, *M. Siberica*, *M. lanceolata*, *M. maritima*, and *M. alpina* are equally valuable species.

Another showy genus is the Silene or Catchfly, with numerous species. Among the best we have *S. Pennsylvanica*, with ample pink flowers, produced in great profusion; and *S. Hookeri* with rose colored flowers; while *S. rotundifolia*, *S. Virginica*, and *S. regia* have large scarlet flowers. Very pretty is the moss-like *S. acaulis* with ample rose colored flowers.

Dianthus alpinus is a nice little plant with purplish flowers.

Quite a gem is *Papaver nudicaule* with its large and showy yellow flowers

Aster alpinus has very large heads of violet flowers.

Solidago Virga-aurea var. *alpina* has large clusters of yellow blossoms.

Dryas octopetala has whitish foliage and snow white flowers.

A beautiful genus is the Gentiana, with nearly fifty species and varieties, but most of them are known only from herbarium specimens. *G. Andrewsii* has large clusters of blue flowers, that never open. *G. Saponaria* has also blue flowers and so have *G. calycosa* and the showy *G. angustifolia*; while *G. alba* has flowers of a white or greenish color.

Swertia perennis somewhat resembles the last genus, and has blue flowers.

Very floriferous and showy is the *Chrysogonum Virginianum*, with ample yellow flowers.

A plant of sterling merit is *Stokesia cyanea*, with numerous and very large flowers of beautiful lilac color.

Mimulus cardinalis grows about eighteen inches high, and bears many large red flowers

Some of the Pentstemons can also come under this heading.

P. Cobœa has the largest flowers of the genus; they are of purple color and sometimes even three inches long. *P. grandiflorus* has glaucous foliage and large spikes of dark purple flowers; while *P. secundiflorus*, of nearly the same habit, has lilac flowers, and *P. centranthifolius*, with shiny leaves, has long spikes of bright red blossoms.

Very little known are *Hesperochiron Californicus* and *H. pumilus*, both of very dwarf habit and producing great quantities of large white flowers.

Ruellia ciliosa is a good plant, with large flowers of pale blue color.

A remarkable plant is the *Lewisia rediviva*, which has a long root, fleshy leaves, and large beautiful rosy blossoms.

The Parnassia has thick shining leaves, and whitish flowers.

Several species of Houstonia are very ornamental from the multitude of their blue or white flowers.

The Callirrhoe is a beautiful genus of trailing plants; the best species are *linariloba* and *involucrata*, both with large purple flowers.

Linnæa borealis, or Twin-flower, has trailing branches, which when covered with their purplish flowers present such a pleasing sight that we cannot wonder at the fondness shown by the celebrated Linnæus for this little plant; which was afterwards named in his honor.

The beautiful genus Trillium consists of several species and varieties, all producing large and showy flowers in the early season. *T. grandiflorum*, with erect large white flowers, is decidedly the best; while *T. cernuum* and *T. erectum* have the same colored, but nodding flowers. *T. sessile* has dotted foliage and reddish blossoms. *T. erythrocarpum* has white and purple flowers. *T. pusillum* and *T. nivale* are dwarf little plants, the former with rose colored flowers; the latter with white. *T. ovatum* is said to have white, *T. stylosum* rose, and *T. petiolatum* purple blossoms.

Anemone Pennsylvanica, *Œnothera speciosa*, and *Conoclinium cœlestinum* are all showy plants, but they are objectionable on account of their running underground stems, to which I have already alluded; yet where a suitable place can be had they should be grown, because they do not require such care to bring them to perfection as alpine plants do.

And now we come to the

Water and Bog Plants. — This class owes its name to the wet character of the positions in which the plants are found natu-

rally growing, conditions from which we cannot much depart in our culture. Among the Bog Plants we find quite a variety from different families, while the Water Plants proper belong chiefly to the Nymphæaceæ. These plants are very valuable to the cultivator, as with them he can beautify unsightly, marshy grounds, as well as add beauty to ponds or streams of water. Where there is no such place naturally, an artificial one can be made by excavating a basin in the lowest part of the garden, in which water will collect, or may be introduced by artificial means.

All plants belonging to this class delight in rich soil, and the full benefit of light and sun. They are propagated from seed and by division of the roots. In the case of water lilies, when it is desired to sow them directly in a pond or lake, the seeds may be put into a small ball of clay, and then dropped into the water.

To ensure good flowering the water lilies should not have more than one and a half feet of water over their roots in summer; while from two to four inches is quite sufficient for any bog plant. But in the winter deep water is very advantageous, as it prevents the frost from penetrating to their roots, and forms the best protection that can be given them.

The queen of all water plants is certainly the Nymphæa, or Water Lily. First we have *N. odorata*, with its beautiful, large, fragrant flowers of pure white color; then comes the variety *minor*, similar to the type, but with smaller flowers; and then again the gem, the rare rose colored variety, which is a beautiful acquisition. *N. tuberosa* has very large leaves, usually standing straight above the water, while the flowers, which measure as much as nine inches in diameter, are snow white. There are two more species described, namely, *ampla* and *elegans*, both natives of Southern States, and said to have white flowers. I have not seen or grown either of the two, and doubt whether they would be hardy here.

The Nuphar, or Yellow Water Lily, is a similar genus of valuable plants. *N. advena* has large leaves, mostly raised above the water, and cup-shaped flowers of a yellow color, sometimes striped with red. *N. luteum* has floating leaves and ample yellow flowers, while *N. pumilum* looks as if only a smaller form of the foregoing. *N. sagittifolium* has arrow-shaped leaves and flowers of bright yellow color. The Western *N. polysepalum* has the largest flowers of this genus.

Nelumbium luteum, or Sacred Bean, is a remarkable plant, with large roundish leaves usually standing straight above the water, and with flowers of a yellow color.

Calla palustris is not unlike a small Calla lily of our greenhouses.

Arisæma triphyllum, better known as Jack-in-the-Pulpit, is also very ornamental.

The different species of Veratrum are very showy on account of their large bright green foliage, presenting a tropical appearance.

Pontederia cordata has large spikes of blue flowers.

Caltha palustris, or Marsh Marigold, is very ornamental with its numerous and large golden flowers. *C. leptosepala* is a Western species with white flowers.

Asclepias incarnata grows two or three feet in height, and produces clusters of rose colored flowers.

Symplocarpus fœtidus may be objectionable on account of its peculiar smell, but its large leaves and curious flowers are quite striking.

Lobelia cardinalis is quite familiarly known by its large spikes of deep red flowers.

Several species of Iris belong to this class, namely, *I. versicolor*, with large blue and purple flowers, and *I. cuprea*, which produces very freely its reddish-brown blossoms.

Saxifraga peltata sends up large roundish leaves, and heads of showy flowers of rose color.

Acorus Calamus, or Sweet Flag, is also very ornamental, more on account of its bright green foliage than its flowers.

The genus Sagittaria includes several species with arrow-shaped leaves and spikes of white flowers.

Alisma Plantago var. *Americana* is also a good plant, having large spikes of numerous white flowers.

Typha latifolia and *T. angustifolia* are also striking plants, with their long foliage and curious spikes of blossoms.

Helonias bullata is a pretty little plant, with rose colored flowers.

The Utricularia, or Bladderwort, is a genus of several species of mostly floating plants, having flowers usually yellow.

Vallisneria spiralis, *Orontium aquaticum*, *Xanthosoma sagitti-*

folium, *Peltandra Virginica*, and others belong to this class, which we leave now to examine the

Bulbous Plants. — This class derives its name from the thick and succulent body called the bulb, that serves as a store from which the stem partly draws its support. Most of the plants belonging to this class are interesting, while many are of great beauty and merit. They vary greatly in size of flowers, as well as in general appearance, and being distributed all over the States they cannot be successfully grown under any uniform treatment in our gardens.

The ground for the majority of bulbs should be well drained, and should consist of light loam, leaf-mould, and a good sprinkling of sand; a thin layer of sand on which the bulbs are placed when planted is advisable, as it will secure them from excessive wet, and thus prevent their possible decay.

The hardy kinds will grow without much trouble in open places. The half-hardy bulbs do not require any artificial heat whatever, but a good rest after they have finished their growth is all they need; that is, the grower must withhold water from October until the early spring, and for this reason they have to be grown in cold frames, with only sufficient protection to keep out the frost. And I do not doubt that a great many plants which we have to grow under glass would prove hardy if we could keep the ground dry in the winter. The greenhouse kinds require the same treatment as any ordinary plants under glass; only they must have a marked season of growth and rest.

Like other plants they are propagated from seed, which grows easily; they are also propagated from bulblets that form around the main bulb; these should be taken off and planted in a place prepared for their reception until they reach flowering size; which is accomplished in much less time than is required when the plants are raised from seeds. Another way of propagating is by division of the bulb, but this is only practicable with kinds that have scaly bulbs, such as lilies. A time should be taken for this operation when the plant is at perfect rest; the scales may then be taken off and inserted in pots or boxes filled with a mixture of sand and leaf-mould or peat. In this way the scale will soon callous, and form a small bulb at the lower end, which after it is properly developed may be planted in the same way as directed for bulblets.

The most beautiful genus is Lilium, which is much more valua-

ble because all its members may be cultivated out of doors. *L. Philadelphicum*, which is found on hills, grows two feet in height, bearing large and erect orange-red flowers in July. Of similar habit is *L. Catesbœi*, but the flowers are larger and more open, of red and yellow color. *L. Canadense* grows from two to four feet high, and bears several large nodding flowers, either red or yellow, with numerous spots. *L. Columbianum* grows about three feet in height, and has smaller nodding flowers of bright deep orange color. *L. Humboldtii* is one of the most beautiful species, attaining four or five feet in height, and bearing numerous very large nodding flowers. The inner portion is red, while the ends of the petals are deep yellow. *L. parvum* has pretty, erect flowers of deep yellow color and marked with numerous small spots; it grows from two to three feet in height. *L. Washingtonianum* has stems from four to eight feet high, and large sub-erect flowers, white at first, but turning to deep rose and dotted. This beautiful plant has the further great merit of being very fragrant. Of the same habit is *L. rubescens*, which is sometimes considered only a variety of the former; it has nearly erect flowers of beautiful lilac color, changing to purple. *L. Parryi* grows about three feet in height, and bears several large horizontal flowers of primrose yellow color, slightly spotted. The very rare *L. Grayi* has stems two feet in height, with several horizontal flowers, red with large dark purple spots. The rather common but not less beautiful *L. superbum* grows as high as six feet, and sometimes produces even as many as thirty of its large, nodding, red and yellow flowers, which vary greatly in their markings. *L. pardalinum* is a showy plant, growing from four to eight feet in height, and bearing large spikes of its ample and nodding blossoms, which are yellow and red. *L. maritimum* is said to have horizontal, bright red flowers, but I have never seen more of it than a painting. These last-named three species are an exception, as regards culture, to bulbous plants in general, because they require to be grown in wet ground; which is quite contrary to the rule for other plants of this class.

The Erythronium, or Dog's-tooth Violet, is a genus of pretty and neat plants with variegated foliage and ample flowers. *E. Americanum* is quite common in our woods; it has bright yellow flowers. *E. albidum* has white flowers, while *E. propullans* is bright rose. *E. grandiflorum* bears several flowers varying in color from yellow to pure white, or tinted with purple. *E. pur-*

purascens is also a showy plant, bearing several yellow and purple flowers, while *E. Hartwegii* has flowers of orange color. All of this species are hardy plants.

As for the half hardy kinds, we have the Calochortus, a genus of thirty-two species and several varieties, including Cyclobothra, formerly considered a separate genus. All the species are worth growing for the sake of their large and beautiful flowers of different colors. *C. pulchellus*, *Benthami*, *Weedii*, *Kennedyi*, *luteus*, *clavatus*, *aureus*, *fuscus*, and *flavus* all have yellow or orange flowers, more or less tinted with purple or brown, while *C. spatulatus*, *Bonplandianus*, *Gunnisoni*, *macrocarpus*, *Palmeri*, *flexuosus*, *splendens*, *Greenei*, *uniflorus*, *lilacinus*, and *cæruleus* have flowers either lilac or purple, with yellow spots or bands; and the remaining *C. albus*, *Maweanus*, *elegans*, *Tolmiei*, *nudus*, *apiculatus*, *nitidus*, *venustus*, *Nuttallii*, and *Ghiesbreghtii* have white flowers, tinted with lilac and spotted with purple or yellow.

The Fritillaria is a genus of several species, but with the exception of a few they are not much known. *Fritillaria pudica* has large bright yellow flowers on short stems, and *F. recurva* has several ample flowers on a stem a foot high, of a beautiful scarlet color. Both are adapted for frame culture.

Amaryllis Atamasco and *A. Treatei* are two beautiful plants; the former with white, the latter with large rosy flowers.

Milla biflora is another beautiful plant, with large open white flowers.

Camassia esculenta and *C. Fraseri* have spikes of pretty blue flowers.

The genus Brodiæa consists of several showy species; *B. coccinea*, now called Brevoortia, is the best of all; it has large scarlet flowers. *B. volubilis* is a remarkable plant on account of its twining stem, which is sometimes as much as twelve feet long, bearing a head of rose colored flowers. *B. crocea*, *gracilis*, and *ixioides* have yellow flowers. *B. lactea* is nearly white, while *B. grandiflora*, *minor*, *laxa*, *Bridgesii*, *peduncularis*, *Douglasii*, *capitata*, *terrestris*, *congesta*, and *multiflora* have purple or blue flowers.

Among the greenhouse kinds we notice the *Hesperocallis undulata*, with large bulbs and a stem bearing several large pure white flowers that are equal to the well-known Eucharis.

The genus Pancratium, or Hymenocallis, is represented by sev-

eral species, all good and showy plants, having large umbels of ample, pure white, very fragrant flowers. *P. maritimum*, *coronarium*, *rotatum*, *occidentale*, and *nutans* all require greenhouse culture.

Leaving this class, we come to the

ANNUALS, or such plants as spring up, flower, perfect their fruit, and perish within a year; but as in every rule so here we find exceptions. Some plants present in cultivation the same characteristics as annuals proper, but in their native places and conditions they are either biennials or even true perennials.

Many very ornamental and showy plants belong to this class, and being mostly of easy culture they are oftener seen in our gardens than other plants; yet there are many valuable kinds that would be desirable additions to the list of those already cultivated.

They are propagated mostly from seeds, although some may be propagated by cuttings; the former method is the best and the one generally practised. The seeds should be sown in March, either in the greenhouse or hot-bed frame, and the young plants, when large enough, should be potted in small pots, and at the end of May planted out. Where there is no such accommodation, the seed could be sown out of doors in the latter part of April or the beginning of May; but in this way the majority of plants would flower rather late.

A very good way is to sow the seeds of such plants as *Phlox Drummondi*, and several others, in July or August, and keep the plants over winter in a cool frame, such as is ordinarily used to winter the Pansy. If treated in this way they could be planted out in April at the time they begin to flower, and would continue in bloom the whole summer. All plants of this class require good, rich, well-drained soil, and the full benefit of light, air, and sun.

Among the cream of Annual Plants we have *Phlox Drummondi*, with its numerous varieties of almost every color.

We next mention *Gaillardia picta* and *G. amblycodon*, with their large reddish flowers.

All the species of Coreopsis are very showy, such as *C. Drummondi*, *C. cardaminifolia*, and *C. tinctoria*, and all have yellow or yellow and red flowers.

The genus Nemophila includes many beautiful and delicate ver-

nal species mostly with white or rosy flowers; *maculata*, *insignis*, and *atomaria* are the best of them.

Vinca rosea and the varieties *alba* and *alba-oculata* are very showy plants with bright green foliage and numerous large flowers.

The genus Gilia numbers a great many species and varieties, the best of which are *G. capitata*, *G. multicaulis*, *G. congesta*, *G. achillæfolia*, and *G. coronopifolia*, all of different purplish hues.

Helenium tenuifolium is a quite showy plant, two feet in height and bearing numerous yellow flowers.

Verbena Aubletia and *V. hastata* have a profusion of purple blossoms all through the summer.

A very showy and pretty plant is *Xanthisma Texanum*, which grows from two to three feet high and bears numerous large flowers of the purest yellow color.

Stevia Plumeræ is very floriferous.

The genus Collinsia consists of several pretty spring flowering species, such as *bicolor*, *bartsiæfolia*, *verna*, and *grandiflora*, all with white and purple flowers.

The *Martynia* is well known for its showy flowers and curious seeds.

In *Ipomea purpurea* we have a climbing plant of great beauty.

Everybody is familiar with the stately *Helianthus annuus*.

The genus *Phacelia* is quite extensive and embraces many showy plants, of which *P. Whitlavia*, with purple flowers, is the best that I know.

Amongst the several species of Œnothera, or Evening Primrose, especially notable are *Drummondi*, *bistorta*, and *triloba*; all with large showy, yellow flowers.

The genus Godetia deserves to be more extensively grown than it is at present. All its species have large and showy flowers, of colors varying from pure white to the darkest purple; *amœna*, *grandiflora*, *Romanzovii*, *viminea*, and *lepida* are the best.

Rudbeckia hirta, which we find in our fields, is quite ornamental in cultivation.

Gaura Lindheimeri, with its white flowers, is perhaps more cultivated than many others.

Very neat in habit are *Clarkia pulchella* and *C. elegans*; with large purple, sometimes white, flowers.

But the most beautiful and a rather rare plant is *Lepachys*

columnaris, with stems two feet in height, and a number of large heads; the disk is high and purplish; while the rays are yellow. A fine variety of this is called *pulcherrima*; it has the same habit, except that the rays are partly reddish-purple, making it one of the most showy and striking plants. In these last-named two plants we have the exception I have previously alluded to, namely that of plants which are real perennials in their western home, but here must be treated only as annuals.

And now we will see what we can find among the

ORCHIDS.— This class is named after the natural order that the plants belong to. They are all of nearly the same habit and as a rule have showy and very curious flowers. With only two exceptions (where the plants are real epiphytes) all of our orchids are terrestrial, growing in moist and shaded woods or open meadows. Some species are found only within very narrow limits; so that it takes an expert collector to find out the home of some of the rarer kinds.

Some orchids have thick succulent tubers which are renewed annually, while others have creeping rootstocks. As a general rule they are rather difficult to cultivate. They require to be grown in peat and leaf-mould, and must have perfect drainage. The best time for transplanting those that have rootstocks, such as the Lady's Slipper, is just before they begin to grow. Those with tubers should be taken up just when they commence flowering, because at that time they begin to form the new tubers; and if taken later, when fully grown, the brittle roots would be easily damaged and the plant might never recover. The place for these plants should have a northern exposure and be partly shaded and never allowed to get really dry; it should also be covered in the winter, to keep out the hardest frost. The best way of obtaining native orchids is to go to the woods and dig them; and plant them with the rest in the garden. They could be propagated by division, but as they generally decrease in cultivation, and on the other hand have seeds so minute that they are very difficult to make grow and raise good plants, I do not see any other method than the first one mentioned.

First we have the two epiphytes, *Epidendrum conopseum* with purple and green flowers, and *E. venosum* with greenish flowers. Both require to be grown in a greenhouse, in the same way as other tropical orchids.

Among those for ordinary culture, we have *Orchis spectabilis*, four inches in height, with four or five white and purple flowers on a stem.

Arethusa bulbosa has flowers two inches long, of beautiful purple color.

Another beautiful little plant is *Calypso borealis*, with large pink and yellow flowers.

The genus Habenaria consists of several species, all having large spikes of flowers, differing in color. Thus *H. dilatata*, *H. blephariglottis*, and *H. orbiculata* are white; *H. psycodes* and *H. fimbriata*, purple; *H. hyperborea* and *H. Hookeri*, greenish; *H. ciliaris* and *H. integra*, orange; and *H. cristata*, yellow.

Calopogon pulchellus has very neat pink flowers with yellow lines on the lip.

Several of the Spiranthes, or Ladies' Tresses, are pretty plants, with white flowers in a dense spike; *gracilis*, *cernua*, *graminea*, and *simplex* are some of the species.

Epipactis gigantea is a showy plant resembling a Cypripedium; the stems are one foot or more in height, with several large white and purple flowers.

The Goodyera is a genus of four species with very ornamental leaves, besides the white flowers; *G. repens* has small velvety green and white leaves: near to it is the Southern *G. quercicola*, very little known at present. *G. pubescens* is perhaps the best of all, having large dark leaves with numerous white veins; and of about the same size we have *G. Menziesii*, with dark green leaves and a large white band in the middle.

Bletia verecunda and *B. aphylla* are two showy plants, with large spikes of ample purple flowers.

Now we come to the best of the Orchids, namely, the Cypripediums or Lady's Slippers. They are not only the showiest, but also the easiest to cultivate. The most common is *C. acaule*, with large flowers, usually purple, but occasionally pure white varieties are found. *C. pubescens* and *C. parviflorum* are pretty much alike, both having large, showy yellow blossoms, produced singly or in pairs. *C. arietinum* has neat little flowers of purplish color. *C. montanum* bears from one to three white and brown flowers. *C. candidum* is a neat species with white lip. *C. Californicum* has stems with as many as six flowers of light rose and yellow color. The best species is *C. spectabile*, with stems two feet high,

bearing as many as three very large flowers of a rosy color; some are pure white, while purple varieties also occur. This beautiful plant equals if it does not exceed any of the greenhouse kinds which are cultivated with considerable expense. A new species has been recently discovered in Washington Territory, and named *C. fasciculatum*. But I must not dwell too long on my favorites, but pass to a still more curious class, that of

Insectivorous Plants. — This consists of only a few plants, characterized by a peculiar structure of their leaves which serves to capture the insects. The leaves are either hollow, not unlike a narrow pitcher, as in Sarracenia and Darlingtonia, or are furnished with sensitive bristles serving that purpose, as in Dionæa or Drosera. Many naturalists maintain that the captured insect is digested by the secreted fluid, and serves as nourishment for the plant. Yet if we examine the pitchers of Sarracenia, we shall find that those filled with insects decay much sooner than those that have few or none; and again in the case of Dionæa, a leaf that has captured a rather large insect seldom opens again, but decays, while leaves that have not captured any or only small insects will remain healthy the whole season. Again if a leaf be selected and touched with some small object, it will close just the same as if an insect had come in contact with it, and if that operation were to be repeated as soon as the leaf opened, and so kept up for some time, the bristles and leaves would lose their sensitiveness, and the leaf would not close in response to either stimulus. All this shows that the plant cannot benefit by the insect; on the contrary the insect hurts it, by irritating the sensitive parts. We cannot say that these plants were made to capture insects, but only that they do capture them so because they have that peculiar construction. However, as this is only a matter of opinion, I will return to a brief description of the several Insectivorous Plants.

Dionæa muscipula, or Venus's Fly-Trap, has thick bright green leaves, terminated with appendages which are furnished with a few bristles on the inner surface; when these are irritated the leaves close suddenly and remain closed for a time. Its rather large white flowers are borne on stems from six to eight inches in height. It grows in the pine barrens of North Carolina, and should be treated in the same way as above recommended for orchids.

The Sarracenia, or Side-saddle Flower, is a showy and orna-

mental genus of several species. *S. purpurea*, which grows farther north than any other, is a pretty plant with dark purple flowers. This plant is perfectly hardy, and succeeds with the same treatment as has been recommended for bog plants. *S. flava* has erect trumpet-like leaves, sometimes over three feet high, and large yellow flowers; it is hardy if treated like the foregoing and covered up in the autumn. *S. Drummondi* attains the same height, but its pitchers are beautifully mottled and striped with white and purple, while the flowers are red. *S. undulata* is only a variety of *S. Drummondi*, with the half-curved lid. *S. psittacina* has reclining pitchers of green and white, and dark purple flowers. *S. rubra* and *S. Sweetii* are much alike; they have small narrow pitchers and red flowers. *S. variolaris* has sub-erect inflated pitchers, and yellow flowers.

The last named six kinds must be grown in a cool greenhouse, in pots filled with rotten leaves and sphagnum moss. Of this genus more than a dozen hybrids have been produced in English gardens by crossing the different species, and later the hybrids themselves.

The Drosera, or Sundew, is represented by several small plants with white flowers. They can be grown with good success in the same way as bog plants. *D. rotundifolia*, *D. filiformis*, and *D. longifolia* are among the hardiest and best adapted for culture.

Darlingtonia Californica is a very beautiful plant, nearly related to the Sarracenias. It has pitchers over two feet in height, terminating in a kind of hood, with two appendages. The flower is large, of yellow and purple color. The culture is the same as directed for greenhouse Sarracenias.

Next we have the

Succulent Plants. — In some portions of the southwestern part of this country large tracts of land, consisting of very poor sandy soil, and at times without any rain for several months, would be quite destitute of any vegetation if it were not for this class of plants. On such a soil is their home, and there they flourish, being furnished by all-providing Nature with thick and succulent stems and leaves, which serve them as storehouses from which to draw their subsistence in the dry season. Their form and structure are quite striking and ornamental, and besides they have very large, beautifully colored flowers, which I regret to say are of short duration.

They are of very easy culture, the main point being to avoid

any excessive wet; this applies to the hardy as well as the greenhouse kinds; to the latter belong the larger part of this class. Good turfy loam is the best material in which to grow them, and good drainage is indispensable. They are propagated from seed, by division, and from cuttings, in just the same way as any ordinary plants, save that they must be kept rather dry.

We have quite a variety of Succulent Plants. Out of the some forty species and varieties of Cereus, especially noteworthy is *C. giganteus*, which grows from forty to sixty feet in height, and must produce a peculiar effect when seen in its native haunts. Under cultivation we seldom see any large specimens. *C. Thurberi* has a somewhat similar habit, but does not reach that height. *C. phœniceus*, *C. cœspitosus*, *C. Berlandieri*, and *C. procumbens* are of spreading habit, and have large showy flowers.

The Echinocactus, with some thirty species and varieties, is very showy and interesting. As a rule all plants of this genus have globular forms and long spines. *E. bicolor*, *horizonthalonius*, *Emoryi*, *longehamatus*, *Wislizeni*, and *polycephalus* are the best species.

The genus Mammillaria is represented by thirty-seven species and varieties; all nice and compact plants, usually with short spines. The most attractive are *pusilla*, *pectinata*, *radiosa*, *recurvata*, and *Grahami*.

Of the Opuntia we have about seventy species and varieties, and out of that number three kinds are hardy, namely: *O. vulgaris*, *O. Missouriensis*, and *O. Rafinesquii*; the latter two with numerous varieties. *O. fragilis*, *O. Camanchica*, and *O. Pes-Corvi* require some protection. All the rest are more or less greenhouse plants, like all the representatives of Cereus, Echinocactus, and Mammillaria.

Several Agaves are natives. *A. Virginica* is a half hardy herbaceous plant, while *A. Desserti*, *A. Shawii*, *A. Utahensis*, and *A. Newberryi* require to be grown under glass.

Dasylirion Texanum and *D. Wheeleri* are good plants for the greenhouse.

The same may be said of *Cotyledon farinosa*, *C. Peacockii*, and *C. pulverulenta*.

The Yucca, a genus represented in this country by about a dozen species and varieties, is very interesting and useful, on account of its ornamental foliage as well as its large spikes of

ample white flowers. Only *Y. filamentosa* with its variety *flaccida* is hardy, it is therefore more valuable than the species *Whipplei*, *angustifolia*, *rupicola*, *brevifolia*, *Schottii*, *baccata*, *canaliculata*, *aloifolia*, *gloriosa*, and *recurva;* all of which require to be taken under glass in the winter.

Hesperaloe yuccæfolium is a beautiful plant; it has long leaves covered with filaments, and the spike is from two to three feet long, bearing many red, drooping flowers not unlike those of an Aloe. Leaving this class we pass to the

FERNS.—Although this class represents only flowerless plants, yet on account of their delicate foliage they are as valuable to the cultivator as any plants with showy flowers. They grow naturally in shaded and moist woods; a few grow in marshes, while a few occur in dry soil fully exposed to the sun. As a rule all like to grow between stones and several kinds grow only upon rocks.

The transplanting of these plants should be done in the spring, before they start to grow. The soil should consist of equal parts of loam, leaf-mould, and peat, with a liberal addition of sand. The ground should be well drained and set with stones as recommended for alpine plants. The propagating of the majority of ferns can be accomplished by dividing the plants in the early spring. They are also propagated from spores, which should be sown in pans filled with soil, or upon rough stones or bricks, and kept in a moist place until they grow to small plants. But this is only done with the rare kinds, or when a great quantity of a kind is required. In describing the best of the some one hundred and twenty five species, I will arrange them according to their hardiness. First we have those that are perfectly hardy, and thus adapted to fill vacant spaces in shady parts of the garden.

Osmunda regalis, *O. Claytoniana*, and *O. Cinnamomea* are amongst the best of the large kinds.

Struthiopteris Germanica is a beautiful fern with large and graceful fronds from three to four feet long.

Lygodium palmatum is a pretty climbing species having stalks over two feet long with small palmate fronds.

The Aspidiums are quite numerous; the best deciduous species are *Goldianum*, *Filix-mas*, *cristatum*, and *spinulosum*; while *acrostichoides*, *Lonchitis*, and *marginale* are beautiful evergreen species.

Onoclea sensibilis although common is worth cultivating.

The most beautiful and delicate fern is certainly *Adiantum pedatum*, with palmately divided fronds.

Polypodium vulgare is useful for covering rocks.

Woodwardia Virginica and *W. angustifolia* are also ornamental.

The larger species of Asplenium, such as *angustifolium*, *thelypteroides*, and *Filix-fœmina*, are quite showy; of the last named there are numerous varieties in cultivation.

Woodsia Ilvensis can stand more sun than any other fern that I know.

Cystopteris bulbifera has long and arching fronds.

Dicksonia punctilobula soon forms a mass of delicate light green sweet-scented fronds.

The half-hardy kinds require to be grown in a cold frame having a northern aspect; with those we must also class all ferns that are in fact hardy, but owing to their delicacy or small size should be grown with the half-hardy ones. Plants of this class are *Polypodium incanum*, *P. falcatum*, and *P. Californicum*, *Gymnogramma triangularis*, and some species of *Nothochlæna*, *Cheilanthes*, *Pellœa*, and *Woodsia;* also *Allosurus acrostichoides*, the lovely *Adiantum Capillus-Veneris*, *Scolopendrium vulgare*, *Asplenium Trichomanes*, *A. ebenum*, *A. viride*, *A. Ruta-muraria*, *A. septentrionale*, *A. montanum*, and the curious Walking Fern *Camptosorus rhizophyllus;* with others.

The greenhouse kinds are very showy and ornamental, but more expensive to keep than the two sections above named. *Polypodium aureum* is a noble plant with very large glaucous fronds. *P. plumula* has neat arching fronds of dark green color. *P. Phyllitidis* has straight undivided fronds.

Acrostichum aureum is a stately and showy fern with large and thick fronds.

Pteris longifolia and *P. Cretica* are good well-known plants.

Adiantum emarginatum and *A. pilosum* are good additions to our greenhouses.

Woodwardia radicans has a thick stem and very large fronds.

Anemia Mexicana and *A. adiantifolia* are interesting plants.

Nephrolepis exaltata is very showy with its long and narrow fronds.

If desired, some of the species of Pellæa, Cheilanthes, and Nothochlæna may also be grown successfully in this section.

The only remaining class is that of

Greenhouse Plants.—Here we may bring together various

plants not included in any of the former classes, yet valuable either for their flowers or their ornamental foliage.

Among the flowering kinds we have *Salvia coccinea*, the whole plant from one to two feet in height, and bearing continually spikes of bright scarlet flowers. *S. pentstemonoides* grows from two to four feet high, and has very large crimson flowers. *S. Greggii* grows about three feet high, producing spikes of red flowers.

Leptosyne maritima is a very useful plant; it grows about three feet high and produces through the whole winter its large bright yellow flowers on long stems. *L. gigantea* is said to resemble the foregoing but is a much larger plant.

Bouvardia triphylla grows over three feet in height, and produces clusters of scarlet flowers.

A plant worth introducing is *Dendromecon rigidum;* it grows from two to eight feet in height and bears numerous yellow poppy-like flowers. Another worthy plant is *Tagetes Lemmoni*, which forms a bush two feet in height covered with large golden flowers. This is a newly introduced plant, and a strict winter bloomer. I think that this plant may be so improved under culture, as to make it a first class plant.

Several species of Ceanothus are very showy plants, with large spikes of blue or white flowers. *C. Veitchianus* and *C. floribundus* are the best.

Vinca rosea also makes a good greenhouse plant.

Mimulus moschatus is well known for its yellow flowers and its perfume as well.

Asclepias Curassavica grows two feet in height and produces clusters of orange red flowers.

Canna flaccida serves both as a foliage and a flowering plant, having large leaves and bright yellow flowers.

As for real foliage plants, we have among others the *Sabal Palmetto*, *S. Adansoni*, and *S. serrulata*, all with large fan-shaped leaves.

Chamærops hystrix is a dwarf palm, very spiny, with plaited leaves.

The noble *Washingtonia filifera* is a rapid grower, and very striking on account of the long white fibres hanging from the large and plaited leaves.

Oreodoxa regia is a beautiful and ornamental plant having long pinnate leaves attaining large size.

Thrinax argentea and *T. parviflora* are two beautiful plants with fan-shaped leaves.

Lamia integrifolia is also an ornamental plant with pinnate leaves.

To this class of greenhouse plants belong, in brief, all plants that are not hardy, and therefore require to be grown under glass, such as the majority of succulent and insectivorous plants, with several bulbs, ferns, and orchids already described. Here also we may include a supplementary class — that of

HARDY PLANTS FOR FORCING. — This word "forcing" means the process of planting, in a pot or pan, any of the earlier flowering plants, and then keeping them for a month or so in the greenhouse, by which means one may secure blooms in advance of the natural flowering season. For this purpose only good and strong plants should be selected; these should be potted in the autumn, and kept in a cold frame till after the first of January, when they may be brought into the greenhouse, according to the times when they are desired to be in bloom. They generally take from two to six weeks to come into flower; any of the early flowering kinds may be forced without much trouble. I will give here only the names of those best adapted for this purpose, as I have already given descriptions of them under Hardy Herbaceous Plants. They are

Aquilegia Canadensis
" cærulea
Phlox amœna
" subulata
Trillium grandiflorum
" sessile
" erectum
Viola cucullata
" " alba
" pedata
Polemonium reptans
" cæruleum
Iris cristata
" cuprea
" verna
" versicolor
Arabis alpina
Sanguinaria Canadensis
Cypripedium acaule
" spectabile
" pubescens
" parviflorum
Papaver nudicaule
Aquilegia chrysantha
Stylophorum diphyllum
Saxifraga peltata
" Virginiana
" oppositifolia
Arisæma triphyllum
Caltha palustris
Erythronium Americanum
" grandiflorum
" albidum
Thalictrum anemonoides

Dicentra eximia	Spiræa palmata
" Canadensis	" Aruncus
" cucullata	Hydrophyllum Canadense
Trollius laxus	" Virginianum
Uvularia grandiflora	Anemone Pennsylvanica
Smilacina stellata	Waldsteinia fragarioides

and the well known Lily of the Valley, which is found amongst the mountains of Virginia.

This comparatively brief summary of the different classes of Native Plants shows what an immense wealth we have in this country; and yet I have left out all the trees and shrubs. These alone, if considered with regard to their ornamental and economical value, similarly with the plants already described, would fill another paper as long as this; indeed that space would suffice to do them only partial justice.

To grow these plants now under consideration successfully and effectively several cardinal points must be considered. In the first place the cultivator must be a real lover of plants, for many hardships are connected with culture; but the recompense is great. The next thing required is good judgment, and next patience, which will lead to final success.

The ground selected should have such varying exposure, elevation, and consistency as to suit any plant among the different classes. If such ground is not already available, much can be done without great expense by digging out some parts and raising others, so as to make it like a piece of natural landscape. This will look more beautiful, as well as more natural, than some artificial gardens of nowadays.

In such grounds a few trees and shrubs could be planted, so as to break the monotony, and only disclose successive parts to view. Where such an effect is desired, a large irregular space or an entire slope might be planted with some of the most ornamental kinds, and this planting would produce a more pleasing impression than any of the stiff beds in the shape of a star or other geometrical form. For we must remember that while we can imitate nature, we cannot improve on it by artificial means.

In regard to the questions, what plants to select, how and where to plant them, and how to manage them during the different seasons, there are many books treating of these matters, but in general they are of little or no real value to the cultivator. A plant

that may flourish under certain conditions in one State may fail altogether in another part of the country; and without comparing remote localities we may take, for instance, two places close together, one on a hill and the other in low ground, and you could not grow the same plant with like results, under similar treatment, in those two places. Then again, the soil is not the same in every garden; and various other conditions that are required by these plants must be regarded. This plainly demonstrates that no complete rules can be laid down in definite form.

The best book to consult is the book of Nature, that lies open before everybody. That is, one must study the plants themselves, so as to know in what part of the country they grow, at what elevation, and in what soil; to know the exposure and average temperature and humidity; to know the size of the plant, its habit, its flowers, and its growing and resting seasons.

With such knowledge you will be able to imitate nature as far as practicable, which is the real and only way to success. By knowing the habit and flowers of any plant you will know in what place it is adapted to produce the best effect. By knowing the natural station you will know how and in what soil to plant it. By knowing the temperature and atmospheric conditions it requires you will know how to bestow your attention and care upon it to the best advantage; and at last, with patient waiting, you will be sure to reap a harvest of flowers that will repay you tenfold for your trouble and labor.

I cannot close this paper without mentioning the very interesting collections exhibited the past year by Mrs. P. D. Richards, Mr. E. H. Hitchings, Miss Mary L. Vinal, Mr. Severance Burrage, and Masters Frank C. Hyde and Walter E. Coburn. These displays have been very attractive as well as instructive to the general public. I hope that it will not be considered out of place if I add that this Society, which has done so much for the cause of Horticulture in general, would do well to offer special inducements for the cultivation of Native Plants, and likewise for the improvement of any variety, or for the raising of any hybrids that should prove of horticultural interest.

Discussion.

Warren H. Manning said that not one person in a thousand appreciates the value of our native plants. All should visit the Botanic Garden where they can see them systematically arranged and carefully cultivated by Mr. Manda. Most of them are horticulturally valuable.

E. H. Hitchings, referring to the remarks of the essayist concerning the early flowering of the Hepatica, said that on the 1st of December he found a plant in bud. He marked the spot and on the 9th of December, there having meanwhile been three or four days with the thermometer about ten degrees above zero and a three days' snow-storm, he found the plant in blossom under a foot of snow.

Robert T. Jackson said it is important to give high cultivation to the class of plants under discussion. People think they do not need it, but they do. Most our hardy ferns are easily cultivated, but *Woodwardia angustifolia* is an exception. They may be transplanted at any season, and will be fine the next year. The Aspidiums and Aspleniums do not require special soil.

The Irises, especially the English and Spanish, which are bulbous rooted, are an interesting class of plants. Like *Iris versicolor* these two species have narrow petals and small standards. They are best planted early; some planted in November did not do well when those planted in September succeeded. *Montbretia crocosmæflora*, a bulbous rooted plant, formerly supposed to be tender, has been found to withstand our winters. The speaker saw a large bed of it at Beverly which had stood out.

Robert Manning said that he had been entirely successful in cultivating *Dodecatheon Meadia*, *Mertensia Virginica*, *Trillium grandiflorum* and *Arisæma triphyllum* in ordinary garden soil, and he hoped that no one would be discouraged from planting them in a similar location by the remarks of the essayist concerning the soil required by them.

Mr. Manda said that he had recommended for the plants named in his paper such soil as they grow in naturally, but he did not wish it to be understood that none of them will grow in any other soil.

Mrs. H. L. T. Wolcott said that she had *Arisæma triphyllum* growing abundantly on a hillside; it might have taken French

leave, but it was there the last time she looked. She was once obliged to move an entire garden of herbaceous plants in July, and by taking care in watering made them live and do well. A plant of *Aster Novæ-Angliæ* was moved on the hottest day in summer without being shaded, and became very much wilted, but she watered it and put a newspaper around it, and in four weeks it was green again, and by the first of October it was a solid mass of purple bloom; its persistency was remarkable. She had never thought the Dodecatheon difficult to raise.

Warren H. Manning said that most herbaceous plants will bear transplanting in summer, especially if a ball of earth is taken up with them.

Mr. Hitchings said that he set a few plants of Arisæma in his garden some years ago, and instead of dying out they had increased every year.

The paper for the next Saturday was announced as "Fertilizers, —Agricultural, Physical, Intellectual, and Moral," by Rev. Frederick N. Knapp.

BUSINESS MEETING.

SATURDAY, February 26, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the Chair.

The President as Chairman of the Executive Committee reported, in regard to the subject of encouraging Window Gardening, referred to that Committee on the 5th instant, a recommendation that $100 be appropriated for prizes for Window Gardening by children under eighteen years of age, the prizes to be arranged by the Committee on Establishing Prizes. The report was accepted and, agreeably to the rules, laid over until the first Saturday in April.

Adjourned to Saturday, March 5.

MEETING FOR DISCUSSION.

It was expected that at this meeting Rev. Frederick N. Knapp of Plymouth would read a paper on "Fertilizers,— Agricultural, Physical, Intellectual, and Moral," but owing to the death of an inmate of his family he was unable to be present, and the meeting was adjourned to the next Saturday, for which time a paper on "Investigations Pertaining to Horticulture," by Dr. C. A. Goessmann, Director of the State Agricultural Experiment Station at Amherst, was announced.

BUSINESS MEETING.

SATURDAY, March 5, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the Chair.

Mrs. Dr. J. W. ELLIOTT, of Boston, and
JAMES L. LITTLE, Jr., of Brookline,

having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected.

Adjourned to Saturday, March 12.

MEETING FOR DISCUSSION.

ON RATIONAL FERTILIZATION OF GARDEN CROPS AND FRUITS.

By Dr. C. A. GOESSMANN,
Director of the State Agricultural Experiment Station, Amherst.

Mr. Chairman, Ladies, and Gentlemen: It is with considerable diffidence that I venture to speak at a meeting of the Massachusetts Horticultural Society. Recognizing, as I most emphatically do, the superior information of many of its members regarding the advantages and the disadvantages of the best current modes of practical operations in the various branches of horticultural industry, I do not propose to enter into any detailed discussion of

any particular branch, but merely to offer for your consideration some suggestions of a more general character, from the standpoint of an agricultural chemist.

Judging from late publications and addresses by distinguished horticulturists, here and elsewhere, it appears that a well founded apprehension is quite generally entertained concerning the consequences arising from a serious degeneration and a frequent exceptionally short existence of many varieties of small and large fruits, as well as of prominent garden crops. We are advised from all sides to take particular care to secure our seeds, or scions, as circumstances may recommend, from a healthy stock. No one familiar with the facts on which this advice is based can seriously question its soundness, nor underrate the great importance of the object in view.

While personally in full harmony with the course thus recommended, I venture to ask, Does the selection of seeds and scions from a vigorous parent plant suffice to render a reasonable ultimate success attainable, without material assistance from other sources? Answering this question for myself, I feel impelled to say — No!

Health and vigor may be to some extent inborn qualities; yet their continuation, it will be conceded, depends in a controlling degree on favorable and congenial surroundings. Accepting this circumstance, it becomes obvious that our prospect of success will stand in direct relation to our knowledge of what constitutes congenial circumstances in the case of plants under cultivation.

We all admit that a high character of seeds and scions is of the first importance, and that nobody can reasonably expect to succeed who neglects to pay serious attention to the selection of either the one or the other, as circumstances may prescribe, when entering upon the cultivation and improvement of any particular plant; but we are not less aware that a suitable climate, a peculiar soil, and in particular a supply of desirable plant food are not less important factors in the successful propagation of plants. The best of seeds will fail to secure satisfactory results where any one of these conditions of success does not assist in the work.

In studying the history of progress in horticulture we notice that its special interests have been advanced on two distinctly different lines of investigation, namely, by inquiring into the circumstances which favor the production of new varieties, and by exam-

ining the conditions which tend to produce the best results with existing varieties. Botanists have successfully assisted in ascertaining more reliable modes for the production of varieties; the phenomena of plant life are today far better understood than but a few generations ago. Agricultural chemists have in late years bestowed considerable attention on the investigation of the means which promote a healthy and vigorous growth; in the interest of an economical production.

The best experimental resources of scientists in both these branches are evidently needed to solve in its various relations the problem here under discussion. The observations of the physiologist by means of the microscope can gain importance only when aided, as far as practicable, by the balance in the hands of the chemist.

The tendency towards degeneration in many varieties of fruit and of garden plants, if really existing to the extent claimed by many writers on horticultural topics, must be a deep seated one, and is most likely due to slowly acting adverse circumstances, of various kinds. In some instances it may be the result of an uncongenial climate; in others of an unfit soil; in others due to the lack of a proper supply of desirable plant food; in others again to several of these adverse circumstances combined; and may be in all of them, to some extent at least, attributable to the weakening influence of an artificial system of selection and propagation.

Any attempt to generalize at the present stage of our observation will be considered, quite properly, injudicious. There seems to be but one safe rule to follow, and this consists in studying each case under well defined circumstances, and with all the scientific experimental resources at our disposal, before advocating any special course of treatment.

After these introductory remarks to define my position regarding the question under discussion, I take the liberty to invite your attention to a short discourse on the state of our present information bearing upon successful cultivation of existing varieties of fruit and garden crops.

One of the first requirements for a healthful condition and a subsequent successful propagation of any plant consists in adopting a well devised system of fertilization.

We emphasize this requirement not only on account of its intrinsic importance, but for the further reason that its management

is in a controlling degree within our individual direction. An indifferent system of manuring I consider is at the root of a great many well founded complaints of failure in various branches of horticulture, and in fruit culture in particular.

A system of manuring may be called well devised or rational when it is based upon the results of a careful examination into the composition of the plant under cultivation, and on a due consideration of its natural qualifications for availing itself of the needed plant food both from the atmosphere and the soil. Plants with a well developed and extensive root system may prosper where those with a compact one will fail; and the same statement applies with equal force to the character of their leaf system.*

To determine with certainty the composition of a plant, especially with reference to its soil constituents, requires repeated examination in different stages of its growth, and when raised upon different kinds of soil. The relations of the various mineral constituents of the plant to its successful development must be fairly understood to know what elements of plant food ought to be present in the soil, in an available form, to render success possible.

We may well ask, Can we claim any extensive knowledge regarding these points, in relation to many of our prominent species of fruits or to many of those plants which, in the more limited sense of the word, are known as "garden crops"?

Our stock of information in these directions is in an exceptional degree unsatisfactory. Whatever we know about the chemistry of fruit trees and of special garden crops by any systematic investigation is of a late date, and in most instances thus far of a fragmentary character.

The slowness of the exhaustive action of fruit trees on the soil, on account of their extensive root system, and the beneficial results of a frequent rotation of crops, assisted by a liberal supply of vegetable refuse material and of home-made manures, have apparently delayed the need of a scientific inquiry into the special wants of the orchard and garden on the part of agricultural chemists. A surplus in the quantity of manurial matter has no doubt quite frequently provided for special wants; and in this view

* See plate, in which *a* represents rye; *b*, turnip; *c*, sugar beet; *d*, carrot; *e*, lucerne (Dr. Theodor von Gohren's Die Naturgesetzlichen Grun llagen des Pflanzenbaues, p. 209); and *f*, potato (Dr. Guido Krafft's Die Pflanzenbaulehre, p. 147).

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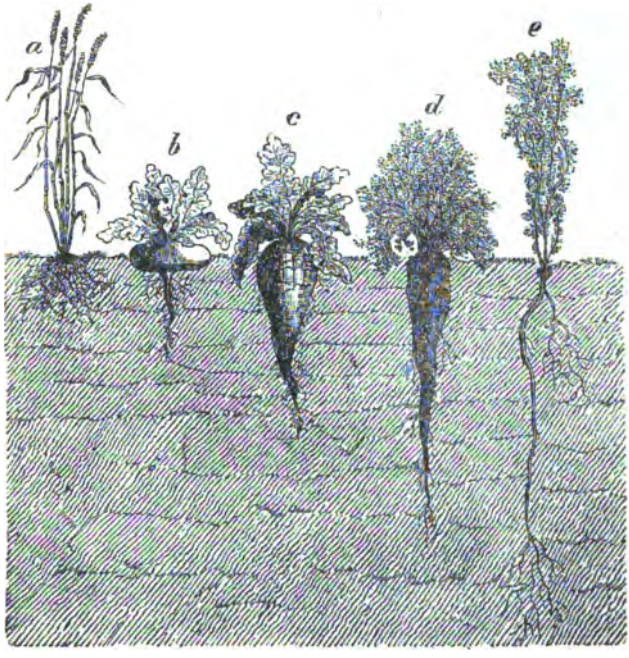
* [illegible] plate, in which *a* represents [illegible]; *b*, turnip; *c*, sugar beet; *d*, carrot; *e*, [illegible] [illegible] Thaer von [illegible] Die [illegible] Grundlagen des Pflanzenbaues, p. [illegible] and *f*, potato. Dr. Gustav Kraft's Die Pflanzenbaulehre, p. 147).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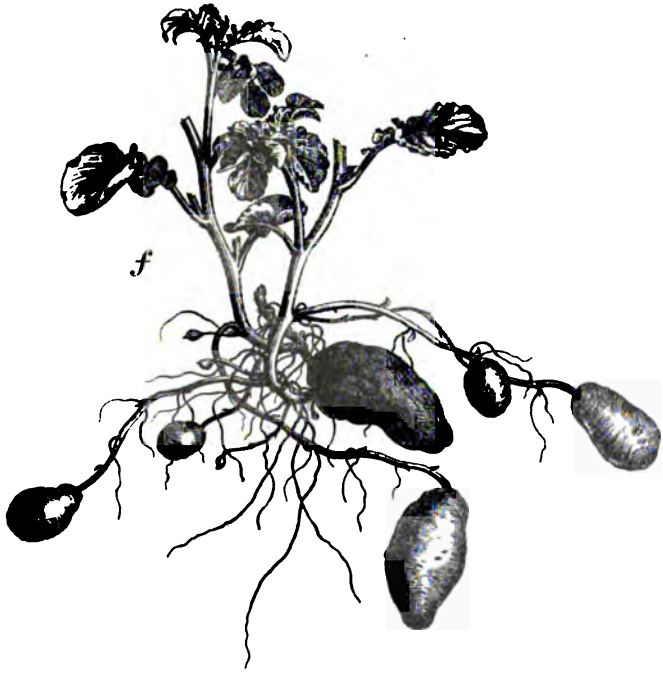
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is secured an intelligent explanation of the results. There is no scarcity of valuable testimony to the fact of an exceptionally good success in raising fruits and garden crops by the aid of compound manurial matters such as barnyard manure, vegetable compost of various descriptions, wood ashes, and others of a similar more or less ill defined composition; yet it is equally well understood that but little satisfactory explanation can be given in many instances regarding the particular relation which exists between the constituents or conditions of the manurial substances applied and the quality of the crops raised by their aid.

The world-wide reputation of barnyard manure and wood ashes dates back not merely one or two centuries; their good effects have been known for thousands of years. Are we prepared to acknowledge that nothing more has been learned during the present century in regard to the feeding of plants than to use a little more or less of either substance, as circumstances may broadly indicate, to secure success? Most certainly not; for we have very good reason to believe that their ancient and general reputation rests on their complex character, and on their beneficial influence over various physical and chemical qualities of the soil. They contain in the majority of cases more or less of all the essential soil constituents which our cultivated farm and garden plants need. They can supply on that account, to some extent at least, not only known but also unknown deficiencies of plant food; and may thus secure, other circumstances being favorable, for a longer or shorter period of time a reasonable return when applied in liberal quantity.

Experience has shown that refuse manurial matter like barnyard manure is most efficient when used for the reproduction of those crops which have contributed materially to its manufacture; and the same proposition may be maintained with reference to the manurial value of vegetable compost or ashes.

The exceptional occurrence of these conditions materially limits, in the light of our present information, their claim of being the best of manures for the farm or garden, and needing no farther supplementing to meet any special deficiencies of plant food. The whole aspect of the question how to manure efficiently has gradually but decidedly changed within the last fifty years.

We prefer today to speak of *feeding* plants. To feed plants intelligently implies possession in a fair degree of two kinds of

information, namely, a knowledge of the special wants of the plant under cultivation as regards the absolute amounts and relative proportions of the various essential articles of plant food, and a familiarity with the composition and the general physical properties of the different kinds of manurial matter at our disposal.

A brief statement of the principal results of a systematic and careful examination into the circumstances which control a healthy and vigorous growth of plants may show in what special directions the growth of many of our garden and fruit bearing plants needs more experimental investigation, to secure a more reliable basis for a proper mode of cultivation with reference to an efficient supply of suitable plant food.

First. All our cultivated plants on the farm, in the garden, and in the orchard contain the same elementary constituents, yet no two of them in the same absolute amounts and relative proportions. The list comprises carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, potassium, sodium, calcium, magnesium, silicon, chlorine (manganese?).

Second. These plant constituents are furnished in part by the surrounding atmosphere, in part by the soil, and some in varying proportions by both.

Third. The essential plant constituents are not needed in different plants in the same invariable proportions at the various successive stages of growth, but are wanted at different stages of growth in different absolute amounts and relative proportions. Each plant has its especial wants at different stages of its development. Grain crops require much nitrogen in an available form during their later period of growth, when blooming and forming seeds; grapevines need a large amount of potash during the growing and maturing of the grapes.

Fourth. The absolute amount of essential mineral constituents may vary in the same plant without affecting, as a rule, the general character of that plant; yet not one of the essential elementary mineral constituents can serve in place of another one to any marked extent without altering, in many instances in a serious way, the relative proportion of the organic constituents of plants. Quite a number of our cultivated plants are more or less susceptible of change in that direction, in consequence of a liberal application of one or the other essential articles of plant food. These changes are as apt to be in our favor as against our best interests.

Fifth. The particular form in which we apply various articles of plant food, as well as the special associations in which they may be applied, exerts quite frequently a decided influence, not only on the quantity of the crop, but also on its quality. The observations contained in this and the preceding statement deserve the most serious attention of horticulturists and nurserymen.

Sixth. The natural resources of the soil in available plant food have proved, as a rule, ultimately insufficient for a remunerative management of the farm, the garden, and the orchard. Older systems of agriculture have failed on account of a scanty supply of manure; and many failures in our present horticulture will be most likely ascribed at some future day to an indifferent system of manuring.

From the foregoing record of well established conclusions, derived from actual observation in the vegetation house, the field, and the garden, we can draw, if we desire, some valuable lessons for our guidance in the practical management of the various branches of agricultural and horticultural industry.

A careful consideration of the different points stated cannot fail to impress us with the fact that to manure our lands efficiently means today something more than to incorporate into the soil an exceptionally liberal amount of some incidental refuse matter of ill-defined composition, as barnyard manure, vegetable compost, or wood ashes. Both good economy and our preference for a healthy and vigorous condition of our cultivated plants advise a change from an indifferent system of manuring to a more rational one.

The steadily increasing consumption of agricultural chemicals and of commercial manurial compounds, for the purpose of supplementing our home resources of manurial matter, is a gratifying endorsement of the good service which systematic, scientific, experimental investigations into the causes of a successful production of remunerative crops have rendered to practical agriculture and horticulture.

Much has been thus far accomplished considering the short period of time since our views regarding these points have thus materially changed; yet much more work is still needed to secure a reasonably adequate control of the subject under discussion. Agricultural chemists have need to make themselves more familiar with the best current modes of raising and improving fruits and

garden crops, thus preparing themselves for the recognition of the particular circumstances which promote success; and horticulturists, on their part, ought to acquaint themselves more fully with the results of the systematic scientific experiments made in their interest; and each in his particular line of industry ought to give them fair and intelligent trial, as far as circumstances admit.

Every attempt at a rational and remunerative system of cultivation ought to begin with an inquiry into the location of the lands and the general character of the soil, to ascertain the special fitness of each for the contemplated industry; and, in case the lands have already been under cultivation for years, their past history ought to be consulted before any particular course of operation is decided upon. Inquiries in these directions are likely to give us some valuable insight into the character and extent of existing and available soil constituents for plant food.

A due consideration of the character and amount of the existing available plant food of the soil, and some definite information in regard to the composition of the plant we propose to cultivate, ought to guide us in the selection of the kind and the quality of the manurial substance. Care should be taken in this connection to secure, within certain limits, a liberal supply of *every essential food constituent* of the plant under cultivation, so as to meet *promptly its periodical wants* when called for. The heavier the crop the larger should be the return of the constituents carried off from the soil. Meanwhile we must bear in mind that success does not depend on any exceptionally large amount of one or the other prominent article of plant food, such as phosphoric acid, potash, or nitrogen, but on a liberal supply of every essential plant constituent; for of the essential articles of plant food that one which is present in the soil in the most limited proportion controls the ultimate result.

I stated in the beginning of my discourse that variations in the composition of many of our fruits and garden plants have not thus far been as thoroughly studied as those appearing in many of our field crops; yet since much assistance may be derived from careful consideration of what we already know in this direction, I add here a compilation of analyses of garden crops and fruits which show the amount, the character, and the relative proportions of the fertilizing constituents they contain. Most of these analyses are taken from the record of E. Wolff, and the remainder from personal observations at Amherst, Mass.

Analysis of Garden Crops and Fruits for Fertilizing Constituents.

TABLE I.

ONE THOUSAND PARTS OF THE PLANTS CONTAIN:

NAME.	Water.	Nitrogen.	Ash.	Potash.	Soda.	Lime.	Magnesia.	Phosphoric acid.	Sulphuric acid.	Chlorine.	Silicic acid.
CORN — (kernels)	144.	16.0	12.4	3.7	0.1	0.3	1.9	5.7	0.1	0.2	0.3
(stalk and leaves)	150.	4.8	45.3	16.4	0.5	4.9	2.6	3.8	2.4	0.6	13.1
POTATO—(tubers)...	750.	3.4	9.5	5.8	0.3	0.3	0.5	1.6	0.6	0.3	0.2
(vines)....	770.	4.9	19.7	4.3	0.4	6.4	3.3	1.6	1.3	1.1	0.9
PEAS—(seed).....	143.	35.8	23.4	10.1	0.2	1.1	1.9	8.4	0.8	0.4	0.2
(vines)....	160.	10.4	43.1	9.9	1.8	15.9	3.5	3.5	2.7	2.3	2.9
BEANS—(seed).....	150.	39.0	27.4	12.0	0.4	1.5	2.1	9.7	1.1	0.3	0.2
(vines)....	160.	....	40.2	12.8	3.2	11.1	2.5	3.9	1.7	3.1	1.9
CARROTS—(roots)...	850.	2.2	8.2	3.0	1.7	0.9	0.4	1.1	0.5	0.4	0 2
(leaves)....	822.	5.1	23.9	2.9	4.7	7.9	0.8	1.0	1.8	2.4	2.4
SUGAR BEET—(roots)	815.	1.6	7.1	3.8	0.6	0.4	0.6	0.9	0.3	0.3	0.2
(leaves)....	897.	3.0	15.3	4.0	2.0	3.1	1.7	0.7	0.8	1.3	1.6
WHITE TURNIP.....	.....	....	....	.....	....	....	....	....	....	....	....
(roots)....	920.	1.8	6.4	2.9	0.6	0.7	0.2	0.8	0.7	0.3	0.1
(leaves)....	898.	3.0	11.9	2.8	1.1	3.9	0.5	0.9	1.1	1.2	0.5
SWEDISH TURNIP ...	.....	....	....	.....	....	....	....	....	....	....	...
(roots)....	870.	2.1	7.5	3.5	0.4	0.9	0.3	1.1	0.7	0.5	0.1
(leaves) ...	884.	3.4	19.5	2.8	0.8	6.5	0.8	2.0	2.3	1.5	2.1
WHITE CABBAGE....	.....	....	....	.....	....	....	....	....	....	....	...
(head)....	900.	3.0	9.6	4.3	0.8	1.2	0 4	1.1	1.3	0.5	0.1
(roots)....	890.	2.4	15.6	5.8	1.5	2.8	0.6	1.4	2.4	1.3	0.1
SAVOY CABBAGE....	.....	....	....	.....	....	....	....	....	....	....	....
(head)····	871.	5.3	14.0	3.9	1.4	3.0	0.5	2.1	1.2	1.1	0.7
CAULIFLOWER..... .	904.	4.0	8.0	3.6	0.5	0.5	0.3	1.6	1.0	0.3	0.3
HORSE RADISH.... .	.....	....	....	.....	....	....	....	....	....	....	....
(roots)....	767.	4.3	19.7	7.7	0.4	2.0	0.4	2.0	4.9	0.3	1.5
SPANISH RADISH....	.....	....	....	.....	....	....	....	....	....	....	....
(roots)....	933.	1.9	4.9	1.6	1.0	0.7	0.2	0.5	0.3	0.5	....
PARSNIP	.....	....	....	.....	....	....	.. .	....	....	....	....
(roots) ...	793.	5.4	10.0	5.4	0.2	1.1	0.6	1.9	0.5	0.4	0.2
ARTICHOKE.....	....	....	....	.....	....	....	....	....	....	....	....
(roots)....	811.	....	10.1	2.4	0.7	1.0	0.4	1.1	1.3	0.5	0.1
ASPARAGUS—(stems)	.....	....	....	.....	....	....	....	....	....	....	....
(roots)....	.....	....	....	.....	....	....	....	....	....	....	....
(sprouts)....	933.	3.2	5.0	1.2	0.9	0.6	0.2	0.9	0.3	0.3	0.5
COMMON ONION.....	.....	....	....	.....	....	....	....	....	....	....	....
(bulb)....	860.	2.7	7.4	2.5	0.2	1.6	0.3	1.3	0.4	0.2	0.7
CELERY.....	841.	2.4	17.6	7.6	....	2.3	1.0	2.2	1.0	2.8	0.7
SPINACH.....	923.	4.9	16.0	2.7	5.7	1.9	1.0	1.6	1.1	1.0	0.7
COMMON LETTUCE...	940.	....	8.1	3.7	0.8	0.5	0.2	0.7	0.3	0 4	1.3
HEAD LETTUCE.....	943.	2.2	10.1	3.9	0.8	1.5	0.6	1.0	0.4	0.8	0.8
ROMAN LETTUCE	925.	2.0	9.8	2.5	3.5	1.2	0.4	1.1	0.4	0.4	0.3
CUCUMBER.....	956.	1.6	5.8	2.4	0.6	0.4	0.2	1.2	0.4	0.4	0.5
PUMPKIN	900.	1.1	4.4	0.9	0.9	0.3	0.2	1.6	0.1	....	0.3
RHUBARB	.....	....	....	.....	....	....	....	....	....	....	....
(roots)....	743.5	5.5	28.8	5.3	....	5.0	1.6	0.6	....	....	....
(stem and leaves)	916.7	1.3	17.2	3.6	0.3	3.4	1.3	0.2	....	....	....
APPLES.....	831.	0.6	2.2	0.8	0.6	0.1	0.2	0.3	0.1	....	0.1
PEARS.....	831.	0.6	3.3	1.8	0.3	0.3	0.2	0.5	0.2	....	0.1
CHERRIES	825.	....	3.9	2.0	0.1	0.3	0.2	0.6	0.2	0.1	0.4
PLUMS.....	838.	....	2.9	1.7	....	0.3	0.2	0.4	0.1	....	0.1
GOOSEBERRIES	903.	....	3.3	1.3	0.3	0.4	0.2	0.7	0.2	....	0.1
STRAWBERRIES.....	902.	....	3.3	0.7	0.9	0.5	....	0.5	0.1	0.1	0.4
GRAPES	830.	1.7	8.8	5.0	0.1	1.0	0.4	1.4	0.5	0.1	0.8
(seeds)....	110.	19.0	22.7	6.9	0.5	5.6	1.4	7.0	0.8	0.1	0.2

TABLE II.

These analyses were carried out for the purpose of showing the relative proportions of the stated elementary constituents of the ash. Sodium, chlorine, sulphur, and silicium were, for various reasons, excluded from the investigation.

Name.	Per cent. of crude as contained in one hundred parts of dry matter.	Relative percentage of essential constituents in one hundred parts of ash.				
		Potash.	Soda.	Lime.	Magnesia.	Phosphoric acid.
Lombard Plums.....	.29—.35	76.59	.....	13.26	2.17	7.44
Peaches.....	.34—.35	74.46	.....	2.64	6.29	16.03
Baldwin Apples....	.22—.25	68.54	1.71	7.28	5.52	20.87
Asparagus—(stem)..	.....	42.94	3.58	27.18	12.77	12.31
(roots)....	.....	56.43	5.42	15.48	7.57	15.09
Clinton Grapes.....	.78—.88	57.40	3.51	13.10	7.24	17.87
Concord Grapes....	0.88	62.29	.....	15.50	1.76	18.49
Cranberries.....	0.179	47.96	6.58	18.58	6.78	14.27
White Currants....	0.59	53.81	.....	17.46	4.72	22.54
Black Raspberries..	.33—.44	50.00	.....	19.44	9.60	20.47
Blackberries.....	.35—.40	51.42	.....	17.22	5.80	24.13
Blueberries.....	0.16	31.36	.....	28.02	9.25	29.05

A close examination of these analytical results reveals in many instances remarkable variations in regard to almost every essential fertilizing constituent of plants. Some contain one part of phosphoric acid to one part of potash, others one of the former to two, three, four, and even as high as five parts of the latter. A similar variation may be noticed as regards the relative proportions of phosphoric acid and nitrogen; in most instances we find more phosphoric acid than sulphuric acid and chlorine, yet in some species of plants more sulphur and chlorine than phosphoric acid may be noticed. Similar circumstances exist as regards the proportions of lime and magnesia.

The recognition of these conditions obliges us to concede that none of our ordinary manures, composed of refuse matters, can be considered in the majority of cases the most suitable fertilizer without the addition of some one or more articles of plant food in a suitable and available form. Good economy and a regard to healthful conditions of the soil advise that course.

There still remains one point of importance to which I desire to call your attention in this connection, namely, the careful selection of manurial substances with reference to the most advantageous form.

A productive agricultural or horticultural soil implies, for various reasons, the presence of decaying vegetable matter; this condition we secure either by a direct addition in the form of barnyard manure, or some other vegetable refuse material incidental to our industries, or by green manuring, or a judicious system of rotation of crops. The latter course is in many instances the safer one, as far as the preservation of a healthful condition of the soil is concerned.

An excessive accumulation in the soil of either animal or vegetable matter, or of both, is apt to turn it into a breeding place of injurious parasitic growths. For this reason it is not advisable to secure a liberal supply of the various essential articles of plant food by the use of an exceptionally large quantity of barnyard manure or of any organic refuse material of a similar character.

A moderate use of these substances, supported by a proper addition of concentrated commercial articles of plant food for the purpose of rendering them complete fertilizers, deserves in the majority of cases particular commendation on account of the directness and certainty with which we can reach the object in view.

The adoption of this course of manuring our lands has not only materially improved our chances of securing larger crops, but, what is of not less importance, it has enabled us to notice the particular influences which the different essential articles of plant food not unfrequently exert on the quality of the crop. Observations in this direction are today so well established that no one familiar with the facts can reasonably question their important bearing on vital interests in agricultural and horticultural industries.

We have good reason to believe that not only the particular form, but also the particular association and relative proportion, in which we apply the various articles of plant food, will, under corresponding conditions of season and soil, control in many instances the special commercial value of our crops.

We begin to discriminate between muriate of potash and sulphate of potash; we learn that a liberal supply of nitrogen and potash, in the absence of a corresponding proportion of phosphoric acid, tends to retard the timely maturing of some crops; it is not less recognized that sulphate of lime and sulphate of magnesia (kieserite) favor in an exceptional degree the growth of leaves and stems; sulphate of magnesia (kieserite) used in connection with potash compounds is known to send the potash to the subsoil and has thus proved a most efficient remedy for clover and beet sick lands; and the same effect may be expected in our orchards, as far as distribution of potash is concerned.

More observations of a similar character might be mentioned in this connection, yet I cannot attempt, on an occasion like the present, an exhaustive treatment of the matter under discussion. I take the liberty to call your serious attention to the previous statements merely on account of their suggestive importance.

To be able to produce in some plants, or in a particular part of any plant, an exceptionally large amount of sugar, or starch, or acid, or nitrogenous matter; in others to cause an exceptional development of leaves and stems; and again in others to exert a decided influence on the length of time required to reach their full maturity means in the end nothing less than that our chances for controlling the quality of our crops are daily improving. The results thus far known are of sufficient importance to incite us to active participation in a systematic course of experimental observation, by which we may hope to make further progress in a rational system of special fertilization.

A careful study of the growth of many species of plants has revealed the fact that, as a rule, every one of them has some inherent tendency to develop, under special circumstances, in some particular direction. In some instances the flowers are most disposed to a change; in others, the seed; in others, the fruit; in others, the tubers or the roots, etc.

Our cultivated varieties of field and garden crops are evidently the results of systematic endeavors through ages to develop these inherent tendencies of plants in directions promotive of the benefit of humanity.

Each age has contributed its fair share, considering its special resources, toward the present advanced condition of horticulture. The introduction of an intelligent system of special fertilization in the interest of a desired development of the natural or inherent tendencies of our cultivated plants may yet prove a contribution to horticultural practices worthy of our progressive times. Horticulture was a highly developed art before botany was known as a science; yet no one in any degree familiar with the present relation of botanic research to the various horticultural industries would for a moment question seriously its beneficial influence on their recent progress. Give to chemistry a similar chance to demonstrate its influence and the result cannot be doubtful.

Discussion.

William C. Strong said that there were few persons in any assembly who could follow such a paper as had been read. It is most valuable for its simple statement of fundamental truths. The fact that so much progress has been made in the last fifty years in all professions — that of medicine for instance — that the laws governing the breeding of animals are so much better understood — leads to the opinion that more progress ought to have been made in the department of vegetable physiology and feeding, but when we listen to such an essay as Dr. Goessmann's we feel that this deficiency will soon be supplied. We see the necessity of further investigation; we see that it will not do to supply too large a quantity of vegetable food to plants; it is like overloading the stomachs of animals. Farmers cannot make the investigations needed, and it is fortunate that we have such a man as Dr. Goessmann to do it. It is wise economy for the state to supply the

means whereby he can do it, and the speaker hoped that he would be well supported in his experiments.

Edmund Hersey asked whether more nitrogen was required by grain crops the last of the season than earlier, to which Professor Goessmann replied, Yes.

Mr. Hersey went on to say that he had been much perplexed by the question what is really in the soil. Soils vary in each field, and unless we know what crops have been grown and what fertilizers have been applied we are working in the dark. Suppose that, on a piece of land where phosphate has been applied freely, he raises a crop which does not need much phosphoric acid, ought he not to remember that? Can we distinguish by the growth of the plants what element preponderates?

Professor Goessmann replied that the knowledge of what has been applied to the soil and taken from it in past years is most important information, for by it we can judge of its probable deficiencies. If the crops have carried off a large proportion of phosphoric acid and little has been applied we need to apply more. He spoke of a field which had been prepared for experiment by cropping with corn until no more would grow. It was then divided into twelve parts; the first for nitrogen in the form of nitrate of soda; the second for sulphate of ammonia; the third for nitrogenous organic matter, there being an equal amount of nitrogen in each case. The fourth had a fair amount of phosphoric acid; the fifth muriate of potash, and the sixth sulphate of potash. The crops on all the plats came out of the ground alike, but only those where potash was used carried them out and yielded a complete crop. If the past history of the ground had been taken into consideration this might have been expected; it had been in grass and corn. The farmer should study the past history of his soil, considering its quality, general character, and what has been grown on it. By such study, combined with experiments in the special application of potash, phosphoric acid, and nitrogen, each by itself, he can tell better what his land needs than the chemist can without such information.

The Professor said he was much pleased with the progress which has been recently made in the knowledge of the subject under consideration. Ten years ago no commercial fertilizers were used for fruit crops; now he receives many letters asking intelligent questions on this point, and farmers generally are today far more

enterprising and intelligent in their use of fertilizers than a few years ago; we need, however, to make systematic experiments at our stations, and not form hasty conclusions from a single trial. Contradictory reports of experiments can be explained by the fact that not all the circumstances are known.

In reply to a question the Professor said that magnesia is wanted in some soils as well as the three substances before named. Professor Ville found that wheat would not form the seed without sufficient magnesia. Magnesia compounds ought to be more generally tested for efficiency. Potash is one of the most important articles which soils are not generally able to supply, as they can lime and magnesia; but soils lying on granite rocks containing felspar are not usually deficient in potash.

The great advantage of barnyard manure and compost is that they contain all the constituents of plant food. But we can do better than to use these exclusively, and particularly when it comes to the quality of the products; which we can improve by the use of special fertilizers. In one case it is the fruit that is wanted; in another the flowers. The proportions of sugar, starch, and other constituents can be changed by the judicious use of special fertilizers, and in this direction there is a wide field open for research in future. If we follow Nature we can turn special fertilizers to account as well as special selections; one is the work of chemistry, the other of botany. Farmers can carry on experiments in this direction: if one man in a community takes them up others will follow. Farming is an art, chemistry is a science, and they should go hand in hand. To establish a fact requires a full knowledge of all the circumstances of the case. The object of all scientific inquiry in regard to the culture of the soil is to ascertain the basis of success. If this is once recognized its adoption is easy.

Horticulture has a great advantage over agriculture in the means of information which it possesses, owing to the variety of crops with which it deals, while in agriculture the number is few. The less the number of crops raised in any locality the sooner they fail. It takes time for soil to recuperate when exhausted.

Leguminous plants are preferred for green manure because they root deep and bring fertilizing matter from below to above. Buckwheat is very nitrogenous and therefore eligible. Plants with large leaves and stems are desirable for this purpose. But we must

keep in mind that green manuring is not enriching the soil, except in nitrogen. It may sometimes do well once when it would not succeed a second time. It gives nature a better opportunity to prepare the inherent resources of the soil. The use of clover as a green manure has given relief at first, when afterwards its effect has disappeared. The deep rooting plants like clover and lucerne should alternate with grain crops in a good rotation.

Such legumes as horse beans, lucerne, red clover, and lupines, which draw fertility from the subsoil and bring it to the surface, have been aptly called vegetable subsoil ploughs. At the Agricultural College Farm the speaker planted horse beans and lupines on land which had not produced above half a ton of hay to the acre; the crops grew as finely as any ever seen, and they were turned under and grass was sown and there was not a finer catch in the town. The horse bean needs far less potash and phosphoric acid than grass. The aim of the farmer should be to supplement the natural resources of the soil. It is impossible to decide by chemical analysis of a soil what it is capable of producing. Most experiments are mainly of educational interest; they are not intended to show farmers how to work, but to illustrate the principle involved. We should aim to grow crops of good quality and should select for seed only the best and most mature specimens.

Mr. Hersey said he had drawn the conclusion from his experiments that corn needs a good deal of phosphoric acid to carry it out.

Dr. Goessmann said that the seed of corn has about four times as much nitrogen as the stalk. When the seed is formed the nitrogen and phosphate are not just taken from the soil, but have been for some time moving to the centre of growth. He had not been able to raise a potato with twenty-five per cent of solid matter; one which contains only twenty per cent is imperfect. We have not yet settled on what is the requirement of a perfect seed for cultivation; this can be best ascertained by scientific investigation. The heaviest potato is the one to be selected for propagation.

William D. Philbrick said that he was engaged in market gardening and had never been troubled by over-dosing.

Dr. Goessmann said that undecomposed vegetable matter in the soil might encourage parasitic growth. We put in as much

manure as we think will pay, but we have not yet learned fully the effect of over-dosing; we do not know how much organic matter may be produced by manure. In some of his experiments he had found that lime accumulates in the diseased parts of trees and potash is deficient. He thinks that many of the diseases of plants may be due to excess of undecomposed vegetable matter or barnyard manure in the soil. Fifteen or twenty years ago we might have rolled our seed in fertilizer without injury, but now we cannot because the fertilizers are more concentrated.

Mr. Hersey said in regard to over supply of manure that he had found that some plants would bear it and others would not. In order to get enough potash for potatoes from barnyard manure you must apply more nitrogen than is needed, and the over supply of nitrogen may be injurious. Asparagus does not seem to be injured by an over supply of manure; he had applied at the rate of seventy-five cords per acre for successive years.

Professor Goesmann said that agriculturists well know that crops do better for rotation. The natural tendency of rain is to carry down the plant food in the soil. This is one reason why an alternation of shallow rooting crops like grain and deep rooting crops like clover and lucerne is recommended. All soluble fertilizers are subject to some loss by leaching; it is difficult to say what proportion of fertilizers is lost in this way; more is lost in sandy soils than in clay, but the loss is not so much as is generally supposed. Drainage water shows no more nitrogen where that element was applied than where none was. In an experiment in passing water through the soil, no phosphoric acid was noticed until nitrate of soda was applied. One farm may need one crop and another a different crop to take the plant food which was out of the reach of the previous crops.

On motion of Francis H. Appleton a vote of thanks to Dr. Goessmann for his admirable and interesting paper was unanimously passed.

The Committee on Discussions gave notice that on the next Saturday William J. Stewart would read a paper on the "Progress of Commercial Floriculture."

BUSINESS MEETING.

SATURDAY, March 12, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the Chair.

The President read the following letter:—

BOSTON SOCIETY OF NATURAL HISTORY,
BERKELEY STREET, BOSTON, MASS.,
March 10, 1887.

Dr. Henry P. Walcott:—

DEAR SIR,—The following vote was unanimously passed by the Council of this Society at its last meeting and has been sent to the Mayor and Board of Aldermen:

Voted, The Council of the Boston Society of Natural History, regarding with favor the proposition to devote a portion of the Public Garden to the uses of the Massachusetts Horticultural Society and particularly for its valuable exhibitions, begs permission to support the petition of the Horticultural Society to the City Government, on the ground that if granted it would foster on the part of the public a larger interest in the very objects of the Garden. The Council looks on all movements tending toward the education of the public in natural objects and natural laws with the deepest concern, and believes in this instance that the best interests of the public would be served by as close a relationship as possible between the Horticultural Society and the Garden.

Your truly,

EDWARD BURGESS,
Secretary.

Adjourned to Saturday, March 19.

MEETING FOR DISCUSSION.

THE PROGRESS OF COMMERCIAL FLORICULTURE.

By WILLIAM J. STEWART, Boston.

Mr. President, Ladies, and Gentlemen: Your Committee has asked me to read a paper on the Progress of Commercial Floriculture. The whole history of commercial floriculture in this country is progress — progress so rapid and so remarkable that it

seems almost incredible. What is commercial floriculture? What is a florist? So great has been the development in all lines of business connected with the introduction, culture, and sale of floral productions that our language even has not kept pace with the business; and so we find a great combination of industries for which we have no distinctive or generally accepted names. Thirty years ago, when one spoke of a gardener, or a florist, every one knew what was meant. What is a gardener now? Who are the florists?

I am sure that if I were to confine this essay to a narration merely of the progress in the *culture* of flowers for commercial purposes, I should not be fulfilling the duty expected by your Committee. They desire also to hear something about the great modern marts, where cut flowers are distributed, arranged, and sold, and which a few years ago did not exist. But what have those places to do with floriculture? Many of those employed in them never potted a plant, never syringed a house; many of them know as little of the details required to perfect the flowers they sell as they do of the manufacture of the wire and tin-foil they use, or the baskets they fill, yet they occupy an important place in the florist's business of today. The little industry which forty years ago was only in the embryo state has during the past twenty years made such strides, and its present rate of growth is so great, that it looks as though the future will have to coin new words if it will keep up with the florist's trade.

The commercial idea, this trading in cut flowers by the dozen or hundred, I am well aware is an unwelcome subject to some well-meaning people. I recall a conversation with a gentleman whom you all know, and whose fame as a botanist is world wide, in which he made some inquiries regarding my employment, and I shall never forget the look of disgust which overspread his face as he said, "Yes, yes, peddle them out so much a barrel, just as you would potatoes." There are doubtless many people who agree with him; they grow a flower for itself, they say, and not for its value in dollars and cents. But where do our most beautiful flowers, our most luscious fruits come from, and whom shall we thank for them? They are in many cases, no doubt, primarily the result of the labors and studies of men who have done the work for the love of it alone; but had it not been for that ever-present and all-powerful element in human nature, the desire for gain, and the

energy and enterprise begotten of business methods, these prized results of love's labor would have staid in the spot where they first saw the light, in the possession only of their originator or his immediate friends, and the millions who have enjoyed them would have never known that pleasure.

In these latter years, however, some of our most earnest students of plant life, and of methods of fertilization and propagation, those who are striving hardest to discover or to produce new varieties, are not amateurs, nor are they enthusiasts, working solely for love of the work, but they are men who know the value in hard cash of anything meritorious. The spirit which has spanned the continent with railways, and covered it with a maze of telegraph wires, which lines our streets with magnificent buildings and tasteful stores, and which has thrown the treasures of the whole world at our feet is the same identical spirit as that which animates and spurs on our great hybridizers and rosarians, and which ransacks every corner of the earth, braving the dangers of the wilderness and the pestilence of the tropics in the great quest for something new or rare.

The florist of a generation ago was in most cases a pretty humble and obscure individual. He was generally a man who was employed, by one or several parties, to keep their grounds in order; and occupying as he did a station socially about on a plane with the coachman and hostler he was expected to be as expert at milking the cow, and wheeling out the ashes, as he was at tying bouquets. His hothouses were of the crudest pattern; small, inconvenient, poorly heated, and set with but little regard to fitness of location or aspect. Our modern devices for heating, ventilating, and propagating were unknown to him, and he was as innocent as a child regarding the much discussed questions of the comparative merits of hot water and steam, theories of circulation and radiation, and many other problems that interest his more fortunate brother of the present day. His stock of plants was more of a museum than anything else, and occasionally it was mainly a hospital. The hospitals in some instances are unfortunately still to be found. His bouquets, if we could see them now, would be regarded as curiosities. With a stick in the middle to keep them straight, and the flowers wound on as tightly as they could be packed together, they were indeed marvels of workmanship. About the only designs attempted, besides bouquets, were wreaths and a few crosses. These were fashioned on sticks or hoops.

His customers were just as simple as himself, and the whole cut flower trade of Boston probably would not have sufficed to keep one of our modern flower shops going. Most of us can remember the time when about the only flowers which could be bought in this city were the few stiffly made bouquets that were brought to town every morning, and offered for sale in the windows of some provision dealer or druggist.

What a contrast with the condition of the flower business of today! There are plenty of men engaged in it who in general intelligence, education and refinement, are the equals of those in any other line of trade. It is rapidly becoming a business of vast importance; with a large amount of money invested, with its wholesale, commission, and supply dealers, importers, jobbers, and retailers. It is no longer in the experimental stage, and cannot be successfully conducted at random or by guesswork. Competition and increased investments of capital have brought prices down as low as possible, and the man who does not manage his business carefully and systematically stands but a poor chance to succeed. Foresight, energy, and brains are what tell in the flower trade of today; and there is room in it yet for more men who are blessed with these requisites. The man who raises the best flowers in the market, of any variety, is always pretty sure of good sales at good prices. With such perishable articles, which cannot be produced at will, there will always occur seasons of glut; and at such times it is the man that offers the inferior stock who must go to the wall first.

The tendency of those engaged in growing flowers for the market nowadays is towards specialties. It is certainly better for a man to grow two or three things well and gain a reputation for those specialties, than to produce a little of everything indifferently. Most rose growers now limit themselves to a few varieties, which, for one reason or another, they regard as the most profitable; and the best success is attained where each variety has a separate house. The number of varieties of roses which may be considered as staple, since they are quoted at wholesale in most of the large markets in this country, is about twenty-five, as follows: Bon Silene, Safrano, Isabella Sprunt, Niphetos, Perle des Jardins, Sunset, Papa Gontier, Souvenir d' une Amie, Mme. Cousin, Souvenir de Malmaison, Maréchal Niel, Cornelia Cook, William Francis Bennett, Pierre Guillot, Bride, Catharine Mermet, American

Beauty, Gen. Jacqueminot, La France, Baroness Rothschild, Mme. Gabriel Luizet, Magna Charta, Anna de Diesbach, and Duke of Connaught.

Other varieties which are grown for the market, but less generally, are Douglas, Duchess of Edinburgh, Yellow Tea, Royal Tea, Lamarque, Reine Marie Henriette, Climbing Devoniensis, Boule de Neige, and an assortment of Hybrid Perpetuals, which are forced for winter consumption. The most desirable points in a market rose are continuous and abundant blooming, long stems bearing single buds, and robust foliage, with fragrance, clear color, and good keeping qualities in the flower.

Quite a large proportion of the roses grown about Boston are shipped to other points in New England, Canada, and the West. The shipping trade has grown to be a very important item, and is the outlet through which our surplus finds its way; and which keeps prices up so as to afford a fair remuneration. There is no doubt that during the greater portion of the year there are more roses grown about Boston than it would be possible to consume here; and if the shipping trade were to cease we should be swamped, and prices would at once fall far below the cost of production, bringing ruin to many.

The popularity of the rose seems not to diminish, and it probably will not as long as the demand for novelties is supplied by new varieties. Every year brings forth fresh candidates for popular favor, most of them from the other side of the water; but the proportion of really successful ones is small as compared with the number sent out. The conditions under which a rose is forced for market in this country are so different from those under which it is raised and grown abroad that many roses of European origin whose appearance has at first given great promise have proved utter failures, causing much financial sorrow to those who invested in them.

The Carnation has taken a fresh hold upon popular fancy within two or three years, and deservedly so, for the new kinds which have been introduced recently are in many respects great improvements upon the old varieties. To be valuable now, a carnation must produce its flowers on single stems, so that they can be cut long. The flowers must be distinct in color, large and full in form, and not inclined to burst at the calyx.

The Violet is a popular flower the world over. The only variety

which is generally salable here is the Marie Louise, and this is subject to a disease which has baffled the most experienced violet growers and forced many to give up its culture. The result is that those whose plants have escaped the scourge have reaped a profitable return during the past two years. It is a singular fact that in Philadelphia single violets are the most popular, while here they cannot be sold.

After roses, carnations, and violets, the flowers most extensively grown for the market are those produced from bulbs and tubers, such as Lily of the Valley, Roman Hyacinths, Tulips, Daffodils, and Lilies of several kinds. Dutch Hyacinths, which were so much sought after formerly, are now positively unsalable.

Who would have believed it possible a few years ago that lilies of the valley could be produced the whole year round? Yet it is true that there is not a day in the year when these flowers cannot be supplied in quantity.

Other flowers which may be considered as staple, being regularly quoted in the wholesale market, are Narcissi of several kinds, Freesias, Bouvardias, Mignonette, Callas, Camellias, Myosotis, Lilacs, Pansies, Smilax, and Ferns; also some kinds whose sale is limited to certain seasons, such as Sweet Peas, Asters, Chrysanthemums, Gladioli, etc.

The difference between the varieties called for here, and in England, is seen by consulting the prices current as published in the English periodicals. There we see quoted Tea Colored, Red French, and Safrano Roses, with Tropæolums, Primulas, Poinsettias, Jasmine, Gardenias, Abutilons, Corn-Flowers, Pyrethrums, Pelargoniums, etc. So much for fashion. A wholesale dealer who should offer that list as his stock in trade would starve here.

The extent of the cut flower and kindred industries is much greater than is generally imagined. I have corresponded with such gentlemen as Peter Henderson, John N. May, August Rolker & Sons, W. S. Allen, and J. C. Vaughan, with a view of compiling some estimates which would be approximately reliable; but the figures received vary so much that it is difficult to arrive at a satisfactory conclusion. The importation of Lily of the Valley roots amounts to several millions annually; the growing of these roots for this market being quite an industry abroad. The consumption of cut Tulips alone certainly amounts to many thousands daily during the winter season, and the number of Roman

Hyacinths grown is simply enormous. Cut flowers amounting at wholesale prices to one million dollars in value pass through the hands of commission dealers annually, and the amount sold by growers for the market outside of the commission dealers must be as large, if not larger.

From fifteen to twenty thousand dollars is invested annually in plants of new varieties of roses. Mr. Thorpe estimates that there are six hundred and thirty acres of ground covered with glass in this country, about one half of which is devoted to the growing of plants and one half to the production of cut flowers. There are probably not less than fifteen thousand individuals engaged in growing plants (for sale or for cut flowers) and in florists' stores.

Not less than fifty million plants are sold annually, and the importation of bulbs and plants must amount to nearly, if not quite, half a million dollars in value. Tuberose bulbs, which we formerly imported, we now export in large quantities; and the exportation of Pampas Grass has also grown to be quite a large business. One and a half millions of plumes is probably a low estimate.

But these figures give little idea of the amount of business or number of people directly or indirectly dependent upon the cut flower trade. Consider the material used in constructing greenhouses, such as glass, iron pipe and fittings, hot water boilers and steam apparatus; the labor employed and the money invested in the manufacture of plain and fancy flower pots, rubber hose, fertilizers, insect exterminators, and horticultural tools of all kinds; also the capital invested and the number of people employed in the making of ornamental baskets; and the value of baskets of foreign manufacture, of wheat, immortelles, etc., which are imported annually. One estimate places the value of coal annually consumed at nearly four hundred thousand dollars. Tons of iron are made into wire and wire designs for florists' use; many thousands of pounds of tin-foil, also cords of wood (in the form of toothpicks for stemming flowers, and of plant stakes), are items of considerable account; while the rents paid for stores and the money paid in wages to help of both sexes must amount to a large sum. Enormous quantities of moss, wild ferns, ground pine, laurel branches, etc., are gathered in the woods every year, this one industry giving continuous employment to many people in the country. The Boston market alone consumes annually two mil-

lion wild ferns, two thousand barrels of moss, four to five tons of ground pine, and twenty thousand yards of laurel festoons. These figures are for regular florists' demands, and do not take into consideration the Christmas trade in greens, which of course is very large.

We must not forget the large sums spent in illustrated catalogues, many of which are really works of art, and in postage paid on the same; nor should we overlook the educating influence of the illustrations in such publications, which are generally true to nature, with the result that the average flower painter or engraver of today knows better than to sketch lilies with five petals; and needs not be told that lilies of the valley do not branch or that morning glories do not bear tendrils. The general knowledge of varieties in flowers and of their habits and characteristics, which a florist finds nowadays among his customers, is very gratifying and is significant, showing as it does the educating influence which has been at work—a result which is due largely to the enterprise and liberality of the commercial florists, who have placed the choicest productions of nature's handiwork within the reach of everybody, no matter how poor.

What a wealth of beauty is displayed in the florists' windows today! The old stories we used to read in our younger days of the poor city children who had never seen a green field, a rose, or a dandelion are no longer true. The situation has indeed changed; and rose-buds, violets, sweet peas, and daffodils are now as familiar to the eyes of the children of the street as they ever appeared to the most fortunate of their country cousins.

Is it surprising that horticultural exhibitions, pure and simple, appear to be losing ground? The time when people would crowd into a hall and gaze with open mouthed wonder on a table covered with dishes of pears and radishes and apples, or rows of bottles filled with a variety of flowers, is past and gone. Commercial floriculture gives the people a free exhibition every day throughout the winter in the florists' windows on Tremont street such as in the horticultural exhibitions of a few years ago was never dreamed of. The same is true of fruit. The Italian fruit-stands on our street corners, with their loads of strawberries in April and May, and of peaches and watermelons in July, would have been worthy of an admission fee twenty-five years ago. Even Orchids, as rare novelties, have seen their best days. The commercial flor-

ists have their eyes on the orchids and they are doomed. They will not long be the flower of the few.

Not all of the work done by the florists, however, has been in the direction of art or good taste. We have seen floral designs, so called, which were nothing but hideous monstrosities; and such things have given the critical a fair foundation for wholesale denunciation of the whole business. Flowers have been made to do duty in the manufacture of freight cars, chopping blocks, teapots, bedsteads, shovels, lambs that could not be distinguished from Berkshire pigs, doves that would as readily pass for hens, and a host of other abominations. This is one feature of the progress of commercial floriculture which we may well deplore. Perhaps the best way to remedy this state of affairs is to educate the public to a higher appreciation of work that is really artistic; for as long as people will demand such things and are willing to pay for them of course the florists must supply them.

But floral designs need not be monstrous; and many even that are formal can be made beautiful in the hands of a true artist. Here is the opening for the successful floral exhibition of the future. At the recent Orchid Show held in New York, the most noticeable feature and that which went farthest toward making it a success was the manner in which the grouping was done. Everything was arranged with an eye to artistic effect so that altogether it made one perfect and harmonious whole. Luxuriant banks of ferns filled the shady corners, while beautiful pitcher plants hung above; orchids which grow naturally in the air were attached to old mossy branches overhead; while under the shade of palms and tree ferns whole colonies of Cypripediums peeped forth from verdant banks. After seeing such a picture, no one would think of going back to the old style of exhibition where each contributor sets up his own row, and the result is a lot of loose ends and detached groups without harmony or system, and what might otherwise be a grand and beautiful display is completely spoiled for lack of a comprehensive plan and a master hand to carry it out.

Within the past three years a remarkable movement has been taking place among the florists. They have not only a national society which is already a magnificent organization, but they are uniting in different cities all over the country into Florists' Clubs, so-called. What is the cause of these simultaneous movements,

and what will be the result? I think the cause is principally that the commercial florists find that the horticultural and agricultural societies and similar organizations, from their very composition and nature, cannot adequately represent or serve the best interests of so large and progressive an element. The gentleman of leisure with his few dozen of pet raspberry bushes will carefully pick off a couple of quarts of fruit and hie him to the city; occupying his whole Saturday forenoon with arranging them in a dish on a table and watching with jealous eyes the dish of his neighbor alongside. Another will buy a couple of baskets of verbenas in the spring, take them home, and plant them in his little front garden, and when they come into flower he too will start for the city with his verbena flowers, which he will stick into a row of bottles, and then hang around to see whether the committee will not recognize his self-denial by placing upon his exhibit a considerate one dollar gratuity. But commercial florists have no time or inclination for such trifling. It is too far behind the times. Regarding essays and discussions, there are so many questions that are all-important to the commercial florist of the year 1887 that he cannot afford to divide the time with the market gardener, the farmer, and the fruit grower.

When this Horticultural Society was organized floriculture was but a babe in this country. There was nothing to be made from it pecuniarily. Its members had but little in the way of precedent or example to encourage them and it mattered not whether they were carpenters, farmers, or dry goods dealers; they were welcome so long as they thought enough of horticulture to use their money and their efforts for the good cause. All honor to them. They builded better than they knew; and what more can be wished for the new organizations than that at the close of an equal period of time they may be able to point to a record of usefulness equal to that which is the pride of the Massachusetts Horticultural Society. If it had not been for this and kindred societies commercial floriculture would not have been what it is today. But, as the child when grown to robust stature leaves his father's home and strikes out to make his mark in the world—as the thriving offshoot from the potted plant, finding its quarters cramped, must be taken away and put in a place where its ambitious vigor can find room to work, so the commercial florists, as they feel their strength and as they begin to know their needs,

strike out for themselves in order that they may devote all their time and their best energies to those questions which most concern their own welfare. They do not by this action sever the ties that bind them to this paternal home. They will be seen and heard here, and you will find them all the better sons for having got away from their leading strings and proved their own strength.

They are now taking a lesson in self-reliance and independence — not as individuals, but as a body. The influence which can be exerted by such a union of interests, and the pressure which can be brought to bear wherever and whenever it is necessary, were shown in Congress last winter, when an oppressive bill to double the postage on seeds was withdrawn, chiefly through the efforts of the Society of American Florists. There is plenty of work for them that has not yet been touched. The disgraceful practice of sending out goods under false names, which has flourished in so many quarters, must be attacked with vigor and fought relentlessly until this stigma is removed from the reputation of American dealers; and the travelling impostors who have been going over the country unmolested for years, with their gaudy pictures of flowers the like of which never grew, will soon find the place too hot for them.

The florists are at last beginning to think and act for themselves, and substantial benefits cannot fail to follow for them and for the public. It has been a long struggle for them. Hard work all day and often all night, without a holiday and with scarcely a Sabbath that they can call their own — this has always been, and to a certain extent always must be their lot. These men who have reversed the seasons and have turned dreary winter into a long summer day, whose vocation is to make the home brighter, to add to the beauty and joy of the bridal festival, to cheer up the sick room, and to lessen the loneliness and desolation of the funeral, have come up from very humble beginnings. What they now have has been well earned; and the business of which they are today proud has come not by chance or good fortune but is the result of application, perseverance, and patient toil.

Discussion.

Edward L. Beard said that he was very glad that Mr. Stewart had so well set off the florists' view of floriculture, and he deemed many of the suggestions made worthy of consideration. He felt

that our own Society is bound sooner or later to recognize intelligently the commercial florist. It should do all that it can to encourage his interests; it should do more than it has ever yet done, and should keep pace with the movement which has proceeded so rapidly of late years. While the florists are essentially commercial men they are not the less introducers of new things, and thereby advancers of horticulture. Our Society is one which can afford to take a higher view of this subject than it has yet taken. The interests which control it and the florists' associations have much in common, though they may work in different ways. The recent Orchid Exhibition in New York was an enterprise involving great risks, and it was a great credit to the florists who managed it that they made it as successful as they did, twenty-five thousand people having attended it, paying an admission fee of fifty cents each. No comparison can justly be made between it and our own exhibition, but it shows great activity and energy. As long as the florists' efforts are in such a direction as that horticultural societies ought to encourage them.

Notice was given that on the next Saturday a paper would be read by Francis H. Appleton, on the "Embellishment of Grounds with Trees and Shrubs."

BUSINESS MEETING.

SATURDAY, March 19, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President Benjamin G. Smith in the chair.

No business being brought before the meeting, it adjourned to Saturday, March 26.

MEETING FOR DISCUSSION.

THE EMBELLISHMENT OF GROUNDS WITH TREES AND SHRUBS.

By FRANCIS H. APPLETON, Peabody.

Most of the ladies and gentlemen who listen to my brief words today have probably long since made up their minds as to how their own grounds should be laid out, and have them already

well embellished with trees and shrubs as well as flowers and climbing plants. There are, however, many other people whom our TRANSACTIONS will reach,— there are still more whom we should like to have them reach and benefit,— who would be glad to learn the best methods of planning and planting their grounds, and how to secure or raise their own trees, shrubs, and vines. And while we steadily strive to help the loyal members who attend our meetings and otherwise aid in doing the active work of planning and executing for the Society, it is the non-attendants and non-members who most need to be interested and instructed in the line of horticultural taste.

With this view I desire to direct attention to the fact that our TRANSACTIONS for 1887 can be made practically useful towards promoting an increase in the number of embellished homes in Massachusetts; and, even if such increase cannot always be in the form that might be recommended as best by those most capable of judging, nevertheless any advance in this direction will be a stepping stone to a more general introduction of the best methods, eventually.

Would that more of those living in suburban homes, in villages and on farms, could be persuaded that there is actual value, as well as pleasure, to be gained through the embellishment and protection of their home grounds by a common sense planting with trees and shrubs, and I will add vines.

Some people have not the taste and inclination, while others have perhaps not had their attention sufficiently awakened, to realize fully the benefits of the course proposed, and to know how easily such results as our subject suggests can be accomplished. Consequently the advantages must be shown, and persuasion brought to bear, and advice given as to how the trees and shrubs and vines can be secured, and what varieties it is best to select.

Where the advice of those who have devoted themselves to a study of this subject, as have many of those who are here today, can be secured it should always be sought; and consultation of books, such as we have in this excellent library, would prove instructive in this as well as in all other horticultural matters.

Propagation of trees and shrubs from seeds and cuttings is the cheapest way, and is also an interesting and instructive one; but it is at the same time a slow method of securing a supply and would seldom prove satisfactory to most of those who desire to

embellish their grounds. They would probably prefer to reap the benefits from their work sooner by commencing with something that could be more quickly recognized as a tree or shrub, than could young seedlings. But where land is to be covered with trees for forest growth seedlings can always be used to advantage.

Toil, either mental or bodily, requires daily rest; and how can the toiler be better refreshed than by the rest to be acquired amid tasteful surroundings, in a home made attractive with trees, shrubs, vines, and the landscape views and effects which are formed thereby.

I have in my mind many farm and village homesteads, scattered throughout this and neighboring states, which could be made pleasanter, more interesting to their owners, and consequently of more value, by the mere addition of a few trees and groups of shrubbery.

The occupation of planning, planting, and caring for such simple embellishments is healthful and agreeable on estates of all sizes; and where the treatment of large estates is undertaken upon extensive plans, and under professional management, there is hardly a limit to the skill that may be shown and the beauty that may be developed.

Perhaps decoration of the latter class scarcely needs stimulating, for it seems to be almost an instinct in men of wealth to turn their attention to subjects connected with farming or horticulture; but to form, in the minds of those who are now indifferent to the subject, a desire for and appreciation of such embellishment seems to be the best means to promote a general diffusion of this benefit. By all means let everyone cheerfully do his part in this interesting and important service.

As regards expense, the work proposed can all be accomplished cheaply and surely — provided it be slowly — indeed at almost the cost of one's own care and labor; while at a larger but still moderate cost and with the advantage of experienced advice it can be secured in a shorter time.

Before attempting to state a few general principles for laying out grounds, let us briefly consider of what size it will be best to secure our trees. My experience has resulted in a belief that it is best, as a rule, to set out comparatively small trees,— in the case of evergreens say not over four or five feet high; and to use a considerably greater number than will eventually be needed, in

order that they may give mutual protection until they become well established. The deciduous trees — whose branches can be trimmed in, so as always to bear a proper proportion to the roots — might be set out from six to eight feet high. Shrubs are best with ample roots and small tops in proportion; this rule will also apply to vines.

I think it is generally safest to apply these rules, and where there is any question as to the size of a tree to choose the smaller size; as this will have the greater chance of succeeding. No cast iron rule can be laid down which will apply to all cases. If the site for planting is an exposed one the trees should be small; but if they are to be set out where it is already protected by existing woodland, which will afford shelter to the new trees, there will be fewer required and those that are planted can safely be larger than if in an exposed location. It seems to me that the sizes I have named represent a fair average.

In setting all ornamental trees the ground should be thoroughly prepared beforehand, unless seedlings are to be set, when a slight spading may suffice. To prepare thoroughly for trees of the sizes I have suggested, remembering that we are striving for good success, it is best to dig the holes about four feet in diameter and two or more feet deep; fill them with good loam, and for deciduous trees, shrubs, and vines spade in some good manure.

Every man who plants ought to do so intelligently, and should find a pleasure in personally studying his own requirements. I would advise everyone who is fond of trees to study the habits of growth of a few deciduous species by planting the seeds in three or four boxes, after the method suggested by Mr. Dawson in his paper in our TRANSACTIONS for 1885,* which is quite simple.

Ornamental planting must be adapted to the conformation of the land and the uses to which it shall be put; therefore everyone who owns a homestead, or farm, ought to have a good plan of its outlines, on which may be shown the positions of woodlands, pasture, tillage, and unproductive land; also of the buildings, roads, and ornamented grounds, and the kitchen garden. The watercourses and the differences in level should also be shown. Such a plan continuously kept, with revisions from time to time, is essential to the best results.

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*Part I. page 158.

The roads and buildings should be located with reference to convenience, but where the conformation of the ground or a grove or cluster of trees makes it best to have the roads and paths deviate from a straight line, picturesqueness is gained and no convenience sacrificed. It is often possible, by planting trees or otherwise creating an artificial obstacle as a reason for so doing, to deflect a road or path and thus gain a pleasing effect, without any unreasonable inconvenience resulting; thereby increasing the natural beauty of the grounds, and opening vistas which add to the general landscape effect; and forming scenes of varied grace which no artist's brush can reproduce.

I shall make no attempt to give any detailed plans for planting individual places and developing what nature has provided in ever varying character on the many estates, of all sizes, which afford opportunities in this direction; but will barely mention here a few leading and obvious principles.

Trees should be so planted as to afford protection to both biped and quadruped; and especially the north and north-west sides of buildings should be screened from cold winds by belts of evergreens. These, however, should be not nearer than thirty or forty feet; leaving the interval as a precaution against woodland fires. A gravel walk or road around any building is an additional protection.

The beneficial influences afforded by the direct rays of the sun should be allowed to reach the dwelling apartments of all living creatures, in house or in barn, in summer as well as in winter; and trees should not be so placed as to prevent this when they become large.

Considering trees as a shelter, the evergreens would seem to be the best protection against cold and wind, while deciduous trees will screen us from heat; but, used in combination, both join in producing the best ornamental effects.

I would that we might further encourage individuals to find in the study of such decoration a pleasant pastime; and thus to enjoy advantages that lie at their very door but which may otherwise never be realized.

The study and practice of decorative planting has a value beyond its immediate results, since by cultivating thoughts about trees it stimulates people to read of and study their habits, and thus to acquire a knowledge of their effects upon climate and vegetation, on water sources, and in mitigating the action of dangerous

winds and storms. And if, as there is reason for believing, our forests are being sacrificed so that the welfare of parts of this country is endangered—either as regards the main watercourses on account of the scarcity of water for a large part of the year, and freshets or floods for a short time in spring, or as to the increasing lack of timber, or the consequent unfavorable effect on the climate—what action can be taken to prevent it?

In France, and other foreign countries, the great injury caused by the too extensive cutting of forest trees has been publicly recognized; so that, as I understand, it has been deemed necessary for the good of the country that government permission shall be obtained before any woodland can be reclaimed for tillage; and that such permission shall be granted only upon condition that an equal acreage shall be planted with trees as an equivalent.

The subject of forestry is of course entirely distinct from that of ornamental planting of trees, although one who undertakes the latter is most likely also to acquire some knowledge of the former. There is evident need for promoting knowledge of this subject among our citizens; for we cannot avoid the consequences of our mistakes. As a means of instruction our own Common is a treasure to our citizens, which cannot be too highly appreciated; and has been made such more especially by those who caused many of the trees to be labelled with both their botanical and popular names; which has undoubtedly greatly increased the interest in the subject of which it is so fine an illustration. The number of species and varieties of trees which it contains is considerable.

It will not be desirable to take up your time with a detailed description of the many kinds of trees and shrubs which are suitable for use in embellishing grounds. What is chiefly needed where home grounds remain unembellished, or partially so, is to endeavor to make the owners or occupants of such grounds realize the advantages of forming a systematic plan — serving to show clearly how they might embellish, or might be advised and persuaded to embellish their grounds and roadsides — and then to inspire them to accomplish it as early as possible. There are unfortunately many people who have the opportunity but lack the necessary incentive to ornament their grounds; in whom a genuine love of the natural beauties of the world does not exist, or is not devel-

oped sufficiently to encourage them to become participants in this good work.

Too many omit to plant trees, who could perfectly well do so, because of the old excuse that they grow so slowly and will not benefit the planter. Such a man should recall the grateful shade of many a fine tree, planted in his own or a former generation, which he has been privileged to enjoy. Let that, combined with many a charming landscape picture, seen through a frame of foliage planted by another — perchance an ancestor — stimulate him to go and do likewise. Will he not recognize that, as he reaps benefits from those who have planted before him, so he ought in his turn to plant for those who come after?

Several old works upon this subject, ss well as later ones, have interested me; and one writer in 1796, who was well acquainted, we are told, with still earlier writers back to 1664, cautions his readers in the strongest terms against a "want of spirit" in planting. He says that all who undertake planting must have "industry, spirit, and perseverance to go through with what they undertake; and we recommend to such as are possessed of these valuable qualifications to begin upon a small scale, and to let their seminaries, their nurseries, and their plantations increase with their experience."

He further says, "While, however, we caution our readers against entering immaturely upon the business of planting, we cannot refrain from mentioning the pleasures which result from it. How rational, and to a contemplative mind how delightful, to observe the operations of Nature; — to trace her in every stage, from the seed to the perfected plant; and, from beneath the leaf stalk of this, through the flower bud, the flower, and the seed-vessel, to the seed again! Man must be employed; and how more agreeably than in conversing with Nature, and in seeing the works of his own hands, assisted by her, rising into perfection—" so as to grow as he grows, to bear him company and afford him grateful shade when he shall most need it in advancing years, and when life is ended to be left behind as a most beautiful memorial.

The reputation of this Society is familiar to horticulturists generally throughout the United States, and its name is also known abroad. The esteem in which it is held as an educator is now great, but must largely increase as each new year comes around

in turn, and the opportunities it affords become yet more extensively known. By opening our halls as we do at the seasons when plants and flowers, vegetables, and fruits are in their best condition, we afford occasions and facilities for the display of the results of the cultivators' skill, and for intelligent study and appreciation of them by the public. Our Library is one of the finest collections of horticultural works in the world — is very nearly the best; and it is the privilege of any student in horticulture to freely consult its shelves. The Society's prizes are open to all comers, and its readiness to benefit is only limited by its opportunities or means to act as occasion arises.

Is there not some way by which its power for good can be felt more completely throughout this State? Some way of encouraging everywhere a local horticultural interest, and making more widely known what can be found here at all times; and the fact that our rooms are open for an exchange of views on Saturdays? Such an increase in the field of investigation and practice in horticultural work as might thus be established in our comparatively small and compact State could not fail of good results; while it would yet more firmly secure to Massachusetts her present proud position as respects educational advantages.

We have in our State a varied surface, with a generous proportion of rich arable soil, and other that is better suited to use as pasturage or for the growth of trees. In our climate, where the heat of summer tends so powerfully to dry up the short sweet grass of our pasture lands, do not trees shading the surface of such pastures contribute to ward off the effects of drought, to sweeten the green food and lengthen its supply by preserving moisture longer in the soil, and to otherwise enhance the comfort of the animals grazing under the shelter of their branches?

It is said that animals must be kept out of pastures until the trees are fully established, and this is objected to as impracticable on the score of economy; but have we not lands which appear to be deteriorating gradually, where some such radical means are necessary to preserve their quality, and where, later, such a course may greatly enhance their value? Again, have we not good trees that could be planted in pastures, and which animals would avoid, but which would, with a little care as to trimming their limbs, form shelters to animals as well as to the ground, thus becoming of use in two ways at once?

We know that only amongst tree-covered hills and fields we find the sources of perennial springs, and that these are fast decreasing in many sections of our State; and we all recognize their usefulness, and admire their beauty as the water flows from them in gentle streams, winding perchance beneath tall trees, or between belts of shrubbery, until finally united with the larger watercourses. Is not this a picture of Ornamental Planting such as is by no means an impossibility?

As to the profit to be derived from planting with forest trees for commercial purposes, we should not base our calculation upon the prices of today, but upon the probable prices in the future when the crop will become marketable; at which time, to all appearance, there will be a much greater scarcity of forest products than now. It has been said that land which can be bought for a few dollars an acre is the only land where it is warrantable, in a commercial view, to plant forest trees; and that seems to be an aspect of the question which the advocates of forest planting in Massachusetts must meet. But by embellishing portions of our land, secured when prices are low, with woods intelligently cared for during a period of years, can we not have, in a reasonably short time, ornamental forests in the neighborhood of large cities, and near our towns, where the citizens can find agreeable resting places in their spare hours; with drives and walks well sheltered with foliage during the season when the days are longest, and the hours for pastime, and without business occupation, are most numerous? Often lands that are partially planted by nature can be secured, on which the existing growths may be guided, while new ornamental trees are added — these being so planted as to secure that improved effect and enhanced beauty which a wise mixing of different varieties must create.

No better bequest can the present generation leave to the next than well planted city and town grounds. It must be the best appearing towns, as well as the towns that can show the best financial management, that will take the lead in the future; and a combination of these two good points will decide for the citizen where he shall make his home.

By showing the comparative ease with which tree planting can be done we may hope to promote such results; but in this, as in all such work, we shall find that our efficiency as a Society de-

pends largely upon our accommodations for satisfactorily displaying exhibits which may be made here, and the convenience with which our library can be consulted, and moreover ease in placing our exhibits and also good light in which to examine them are important requisites; consequently we require such halls and rooms as will best and most conveniently serve these various purposes. Thus, a hall on the ground floor and with ample windows, a library with good light and sufficient shelving, and in which quiet can be secured, and committee-rooms such as to allow the quiet consideration of questions of awards and management, are essentials. With such facilities the good work which has always been done here can be largely increased. It seems to be only a question of short time what shall be done to improve the present accommodations.

How can we further aid in bringing about the general home embellishment of which we have spoken? It must be chiefly by increasing and promoting a love for the beautiful, and by fostering a desire to understand the process of formation and growth of our fine trees, shrubs, vines, and plants, that we may hope to materially increase the number of embellished homes in Massachusetts.

Again, by encouraging the judicious decorating and planting of all school-yard borders (allowing ample play ground), and of grounds about all postoffices, railway stations, city and town halls, and all public buildings, where any decoration in this line is possible, we should be taking a foundation step towards the accomplishment of this desirable end. Consider the number of eyes that would then see and minds that would be led to think of the advantages of embellishing grounds; and consider the large proportion of persons who would sooner or later attempt to adapt to their own homes the suggested ideas.

The TRANSACTIONS of our Society for this season will contain valuable papers already presented; one relating to "Trees and Shrubs," by Mr. Levi W. Russell, and another on "Ornamental Climbing Plants," by Mr. John G. Barker. In addition, I would again call attention to Mr. Jackson Dawson's essay on the "Propagation of Trees and Shrubs from Seed," in our TRANSACTIONS for 1885.* We hope also that gentlemen present will add the names

* Part I, pages 145–164.

and descriptions of desirable shrubs in the course of today's discussion. In view of all this information, there would seem no excuse for not knowing with what to embellish one's home grounds; at least wherever our publications shall reach.

I close with the following list and brief descriptions of what seem to me the most desirable trees for planting in Massachusetts, either for embellishment or for their utility as timber.

Acer saccharinum: Sugar Maple. — Good as a forest or as an ornamental tree; will do well on rocky hill-sides, when once established.

Acer dasycarpum: White Maple. — Naturally growing along river banks, but seeming to grow rapidly in almost any situation; does well as a street tree, but is easily broken by ice.

Acer platanoides: Norway Maple. — A round-headed tree of medium size, suitable for shade or ornament; might be used in plantations.

Acer rubrum: Red Maple. — Will grow on any soil, but seldom makes a large tree unless in moist ground.

Ailanthus glandulosus: Tree of Heaven. — Where perfectly hardy will grow on almost any soil; wood excellent in grain for cabinet making.

Betula lenta: Black or Cherry Birch. — Will grow on the poorest rocky soils; good for ornamental planting and also for fuel.

Betula papyracea: Paper Birch. — One of the most ornamental of the birches; a fine tree for large lawns or other plantations.

Betula alba: English White Birch. — A very beautiful ornamental tree. The variety *populifolia*, or American White Birch, will grow in the poorest of soils, and makes good fuel if cut and kept under cover, but rots if wet.

Betula nigra: Red or River Birch. — Grows naturally in low grounds, but is a fine ornamental tree in any good loam; fine for parks or plantations along streams.

Betula excelsa. — This species is found far north, and in the mountains of Western Massachusetts; it grows on seemingly thin but moist soils; a fine tree for ornament or plantations.

Carpinus Caroliniana: Hornbeam. — A small tree; does fairly well on sterile soil.

Carya alba: Shell-bark Hickory. — Though growing in almost

all situations, does best in deep rich loams; good for timber or for ornament, and fine in groups in a park.

Carya sulcata: Western Shell-bark Hickory. — Like the common hickory as regards choice of soil.

Carya porcina: Pig-nut. — One of the best of timber trees, useful and ornamental; slow-growing on poor soils.

Carya amara: Bitter-nut. — Very rapid growing on moist soils, even where the soil is thin; very ornamental, either in groups or single.

Castanea vulgaris var. *Americana:* American Chestnut. — Does well on any soil that is well drained, either for timber plantations, parks, or roadside use.

Castanea pumila: Chinquapin, or Sweet Nut. — A medium-sized shrub here; fine as an undergrowth or on the edges of plantations, furnishing good food for game and also good for man.

Catalpa speciosa. — Highly prized in the West on account of its rapid growth, and its durability; fine also as an ornamental tree.

Fagus ferruginea: American Beech. — A fine tree for grouping in parks or pleasure grounds, and does well in a thin soil when once established; good for fuel.

Fagus sylvatica: English Beech. — Not so spreading as its American cousin, but nevertheless a good tree for ornament.

Gleditschia triacanthos: Three-thorned Acacia. — Rapid growing on any ordinary land; of fine foliage; good for ornamental planting or hedges.

Juglans cinerea: Butternut. — A rapid growing tree in good soil, valuable as timber and for ornamental planting; nuts edible.

Juglans nigra: Black Walnut. — A first class tree for ornamental and useful work; requires to be planted in good loam while small.

Magnolia acuminata: Cucumber Tree. — A fine tree for lawns or parks; neat in its appearance; it needs a deep sandy loam to do well.

Platanus occidentalis: Button Ball Tree. — A fine ornamental tree; thrives fairly on medium land, bnt requires good treatment to make it grow to a large tree.

Populus alba: Abele, or Silver-Leaved Poplar. — A rapid growing tree; used in Great Britain for floors; is easily scoured

to pure whiteness, does not take fire as readily as other woods, and burns very slowly; is also good for paper pulp.

Populus canescens, Gray Poplar, and *P. nigra*, Black Poplar.— The wood of *Populus nigra* is much used abroad for packing cases, especially for bottled wines; the knotty trunks, which are curiously mottled, are made into ladies' work-boxes, which are highly valued in Germany and France.

Cladrastis tinctoria: Virgilia, or Yellow-wood. — A beautiful tree for ornamental plantations, of fine spreading habit, and beautiful in bloom.

Cratægus: Thorn. — All the large growing species form fine fringes along the borders of woodlands or parks; they are attractive both in fruit and flower.

Fraxinus Americana: White Ash. — A tree of the first order for timber; makes a fine road tree, but late coming into foliage; to grow it well requires a good, somewhat moist, soil.

Fraxinus pubescens: Downy Ash. — A tree that will do on higher grounds; but it does not make so large a tree as *F. Americana.*

Liriodendron tulipifera: Tulip Tree. — A grand ornamental tree; and further south it makes a fine timber tree a hundred feet or more in height.

Prunus serotina: Wild Black Cherry. — Makes a fine timber or ornamental tree; the wood is also valuable for turning and for cabinet making.

Quercus rubra (Red Oak); *Q. tinctoria* (Quercitron, or Black Oak); and *Q. coccinea* (Scarlet Oak).—All these do well on light soils. Though not as valuable as the White Oak, they are of much more rapid growth. Nothing is more beautiful than *Q. coccinea* for ornamental planting, and its autumn coloring far exceeds that of most of the other oaks.

Quercus palustris: Swamp Spanish or Pin Oak. — Though naturally fond of moist ground, this will adapt itself to almost any situation. It is a tree of most rapid growth and beautiful form. Trees planted from the seed box on a hill-side without any preparation ten years ago are today fine specimens ten or twelve feet high, of beautiful form. This would make a most excellent street tree. An avenue of these planted at Flushing, Long Island, by Mr. Samuel B. Parsons, some twenty or twenty-five years ago, is the finest avenue of oaks on Long Island.

Robinia Pseudacacia: Common Locust, or False Acacia. —

Flourishes on comparatively thin soils; although in some sections it is troubled with the borer, in some situations it does well. It is of very rapid growth while young, and would make a good nurse tree until others could be grown. The wood is very durable.

Tilia Americana: American Linden, or Basswood. — A much finer tree than the European Linden, and although it loves a moist situation it makes a fine tree in any ordinarily good soil. From the bark can be made a bast equal to the finest Cuban, which is so much used as a tying material.

Salix alba: White Willow. — Also a fine tree; will do well in any good soil; is readily propagated by cuttings of any size, from six inches to as many feet in length. The bark is rich in tannin, and the wood makes a fine charcoal, excellent for gunpowder and fine crayons.

Of the Pine family, nothing is so well adapted to the worn-out soils of New England as *Pinus Strobus*, the White Pine; and nothing will so well repay in a few years the labor required in planting and care. Usually it will make a good sized tree, available for fuel or for box boards, in from twenty to twenty-five years. It is easily transplanted, but a little difficult to grow from seed by amateurs. There are many farms in New England where there are groves of pines, and where thousands of young seedlings from six inches to a foot in height can be found. If a few thousands of these were collected each year and planted thickly in nursery rows for one year, all that were going to die would do so the first season. The following season they could be transplanted in pasture or prepared ground, four or five feet apart each way, after which they would require but very little care and would soon repay the planter in fine groves of pines.

After one or two years a few quarts of acorns might be dibbled in amongst the pines and the resulting growth would serve as the nucleus of a second crop, to succeed the pines.

Pinus resinosa: Red Pine. — Also a fine tree for light lands; of rapid growth, fine as an ornamental tree, but not so valuable as the White Pine for timber.

Pinus rigida: the common Pitch Pine. — Valuable in places where other trees will not grow, such as along the coast and in other exposed situations. In such places it will act as a shelter to the better trees that may be planted afterwards. It will grow readily from seed sown broadcast or in hills.

Larix Europœa: Scotch or European Larch. — An excellent tree for poor lands, and can be obtained from Douglas, of Waukegan, Illinois, at a few dollars per thousand. Plants two years old, transplanted, are the best for forest culture.

Abies Canadensis: Hemlock. — Valuable on hill-sides having an eastern or northern exposure, and near water.

Abies balsamea: Balsam Fir. — Though of rapid growth on ordinary soils and a fine ornamental plant, it is not long-lived; it lives but from thirty to forty years, and is not much used as a timber tree.

Pinus sylvestris: Scotch Pine. — The same may be said of this as of the preceding. Although of rapid growth, twenty-five to thirty years is about all it will last on our thin soils and in our dry climate, though it is excellent as a nurse or shelter tree.

Picea alba: the common White Spruce. — Nothing is better than this for wind-breaks, shelter, or ornament. It is much hardier than the Norway Spruce, and should be planted in preference to that tree, though the Norway makes a fine tree in a sheltered, moist situation.

Of Elms, the American, or English, or Dutch will grow in any situation and make good-sized trees. To have them in perfection they need a good generous soil with considerable moisture.

All the Willows and Poplars can be propagated with the greatest ease by cuttings six inches or more in length; any boy can grow them. Planted six or eight inches apart in nursery rows in early spring, they will at the end of the first season be fit for planting in the field.

All the Oaks, Hickories, Chestnuts, and Walnuts can be started from seed in shallow boxes, and transplanted at the end of the first year in nursery rows or where they are to remain.

The Birches should be sown on well prepared beds, patted down with the back of the spade or pressed with a light roller, and covered with a light mulching of hay until the plants appear, when the covering should be gradually removed. These seeds can scarcely be covered with loam if success is desired. Such seeds as those of the Leguminosæ should be well soaked for twenty-four hours or more before sowing.

Full directions for seed-sowing may be found in Mr. Dawson's paper, which has been before referred to.

At the conclusion of Mr. Appleton's essay, the following paper was read by the author.

Ornamental Shrubs.

By William C. Strong, Newton Highlands.

I have been requested to add a few suggestions in regard to the use of Shrubs; which include a class of plants occupying an intermediate position, in point of size, between the trees and the herbs of the field.

When we consider the vast range of material in the vegetable kingdom, extending from the minutest forms of microscopic fungus-growth and running by easy gradations up to the towering heights of the Sequoias, which lift their giant heads in air more than a hundred feet higher than the topmost stone of Bunker Hill monument, we become lost in wonder and admiration of the wisdom and the goodness of Him who has so freely displayed his limitless resources in the works of his hand. What infinite skill in the vast variety in form and size and diverse fitness for every conceivable requirement! With reverent thankfulness should we seek to make the best use of these gifts of a bountiful Creator.

At the outset, then, we shall naturally consider the special advantages of Shrubs in respect to size.

There is a place for everything and each will fit in its own place better than anything else. We would not be guilty of such incongruity as to dwarf a humble cottage into insignificance at the foot of some mighty monarch of the woods. However much we may admire the noble grandeur of the forests, their heavy shades are not fitting places for the abode of man. Our dwelling places must be under the open sky where we can get the benefit of clear air and warm sunlight. We may use trees for protecting our houses from the too fierce glare of the sun; we may line our streets with trees for shade; we may plant groups for landscape effect and for wind-breaks; but there is a limit to the use of trees in proximity to our dwellings which becomes the more apparent as the population becomes more dense.

It is at this point that we find the greatest usefulness of plants of smaller growth, which will yield wooded effects without producing an overshadowing mass of foliage.

We can readily see how appropriate for the homes in our populous towns are the shrubs and trees of smaller growth, of which

we have an ample variety. Many of these are perfect in form and striking in foliage, giving good examples of trees in miniature. Others are better in groups, or extended banks which may suggest bird's-eye forest views. But a principal use will be for belts of irregular outline, either along the borders of our lot or in other positions concealing the limits of the place and creating vistas which may transform the appearance to a surprising degree. An impression of vigor and luxuriance of growth may be produced by looking down upon foliage, which is wholly lost when trees of larger growth are used.

Again we are to consider that shrubs will give us immediate results. It requires but a year or two to bring most kinds to a good degree of effectiveness. We do not have to wait for growth, as in the care of trees, for they will at once add to the beauty of the place. They are easily manageable in size, are inexpensive, either to propagate or to purchase, and are easily transplanted. And if the arrangements and combinations shall be found at any time to be unsatisfactory it will be perfectly practicable to re-arrange.

The inflorescence of shrubs is, as a rule, conspicuous to a marked degree. There are a few of our hardy trees that are distinguished by their showy flowers, notable among which are the Magnolias, Virgilia, Catalpa, and Laburnum. But nearly all of our shrubs are gay and attractive in their flowers; and these are extended in some varieties throughout the entire season. Many are prized mainly for their inflorescence, like Roses; or like the August flowering Hydrangeas, or the Althæas in September.

And we have marked contrasts in foliage, both in the color and the form, which are readily available to produce most pleasing effects. The colors, the sizes, and the habits of growth are so well known that we can with certainty grade the combination of groups so as to crown the outline entirely to suit our purpose.

Thus we recognize in shrubs many good qualities rendering them peculiarly suited to the adornment of our suburban homes. With such material it is surprising how easily and quickly we may change the boundaries of a rectangular lot of perfect plainness and stiffness into flowing lines of grace and verdure.

And how trifling will be the cost in comparison with that of architectural additions which may seek a similar purpose. A very few dollars judiciously spent in planting shrubs will give a living beauty which in some cases may transform the whole char-

acter of a place. The charm of country life should consist, to a considerable degree, in studying the capabilities of our homes for such adornments.

It cannot have been the intent of your Committee that I should, in this supplemental paper, give a full list of the many varieties of shrubs. I will briefly name some of the more conspicuous and desirable. And of course Roses will be the first in order, by reason of the distinguishing excellence of their flowers. In this respect they are unapproached, and if maintained in vigor and perfect health their foliage is also attractive. Especially is this true of the varieties of the Japanese species *rugosa*. Unless intending to enter the lists in sharp contests for prizes, it will be wise to select the more hardy and vigorous varieties and omit many prize kinds that have too much Tea or Bourbon blood. The lists and the modes of culture have been frequently published in our TRANSACTIONS.

We hesitate to name a worthy follower of this queen of flowers. Perhaps the Rhododendron may take that rank with least dissent. Its fine persistent foliage and its large trusses of brilliant flowers, in great variety of color, are exceptionally gorgeous. We may be inclined to say, after being intoxicated with the display of some large and varied collection, that it is unequalled for landscape effect. Yet we must bear in mind that these results are not realized in general culture; that the conditions to success are absolute and that there are many localities and various purposes to which the character of the foliage and the habit of the plant are not adapted. There is also a liability to injury from the winter exposure which detracts from their usefulness in many positions.

Our native *Kalmia latifolia* can boast of clearer, brighter evergreen foliage, and exquisitely beautiful flowers which, however, are limited in range of color. It is a charming shrub when in its proper place.

The varieties of *Azalea mollis*, of recent introduction, will prove to be a great addition to our list of flowering shrubs if they are found to be sufficiently hardy. At the Arnold Arboretum they have withstood the winter without protection, and my own collection has passed the last two winters without injury. In some other places they have suffered. Their flowers approach the brilliant Indian type in substance and perfection of form, though as yet they are more limited in the variety of colors.

I would give *Viburnum plicatum* a prominent rank. The abundant globular clusters of pure white flowers are more delicate than those of the well-known Snowball and the plicated foliage is much richer and handsomer. The habit of the tree is also better and less liable to disease.

We need not fear to introduce our common little *Clethra alnifolia* into the very best society. Its sweet modesty will always have a charm. Its foliage is attractive and the delicious fragrance of its numerous spikes of flowers in late summer will be the more prized at this season when there are so few shrubs in bloom.

What a contrast there is in the immense *Hydrangea grandiflora;* grand indeed for simple show but as to modest merit laying no claim to our regard. Yet it has great value for August effect.

The foliage of nearly all the Spiræas is well adapted for grouping and for borders. *Spiræa Thunbergii*, being low, with delicate leaves and flowering very early, is well suited for the outer rank. The *prunifolia*, the *ariæfolia*, and the lance-leaved varieties would well follow and be crowned with the stronger *sorbifolia*, or perhaps better still with the upright Josikea lilac.

The Exochorda is worthy of a place by itself and is rather too open for grouping.

We have considerable range in color among deciduous shrubs and are able to make many pleasing combinations and contrasts. The Purple Hazel has very large dark rich purple leaves and is the best for strong effects in this color.

The Purple Berberry has a softer and more delicate hue which is very beautiful.

The Golden variety of the Black Elder gives the brightest yellow for enlivening. Its effect in a group is like that of a beam of sunshine.

The Golden Spiræa, if kept vigorous and well cut back, is also good for the same purpose.

Buist's Variegated Althæa is the most distinct and constant in its marking of any light variegation.

Two new varieties of the red-twigged Cornel, *Cornus Siberica variegata* and *Cornus elegantissima*, are exceedingly beautiful and effective in their bright and varied colors. They are equally hardy to endure the heat of summer and the cold of winter.

Most of the forms of the Japan Maple (*Acer polymorphum*) are delicate in growth and suffer more or less under the full glare of

our sun. The variety *atro-purpureum* has been the most vigorous and hardy with me; and its great beauty justifies any amount of care in its cultivation.

Prunus Pissardi has been received from Persia within a few years and has leaped at once into favor. Unlike the purple beech, the dark rich color of the leaves and the young shoots increases in brightness until after heavy frosts. It attains the size of a small tree, but may easily be kept as a shrub with the finest effect, if freely cut back in early spring.

The Holly-leaved Mahonia (*M. aquifolia*), which belongs to the Berberry family, is one of our finest low evergreen shrubs. Its broad, very diverse, high-colored, watered foliage is peculiarly attractive even throughout the winter, if somewhat shaded from the sun. And its clusters of bright yellow flowers in the spring are no slight addition to its merit.

The umbrageous, fern-like effect of the Cut-leaved Sumac (*Rhus laciniata*) is admirable either in a grouping or a single tree. Its colors are delicate and often brilliant in autumn.

I have already exceeded the time which was allotted to this part of your subject. With my limited space perhaps it would have been better if I had confined myself to the principles to be observed in the planting and use of shrubs. It is at once evident that we have not time to describe or even to name the many varieties of shrubs which have their individual excellencies and peculiarities suited to our varied wants.

No fixed list or rules should ever be given; a broad field should be open for constant experiment. To a considerable degree we may change the combinations of our shrubs from time to time and so secure relief from the fixed character of our buildings and also the permanent effect of our trees. Herein will consist one of the charms of a country life, that we shall go on from year to year adding, varying, and improving with ever increasing zest and a sure approach to the highest art. And we may rest assured that not only shall we succeed in beautifying our homes, but also, and this is of still greater importance, we shall meanwhile be receiving an influence from Nature's silent teachings which will prove to be both stimulating and ennobling.

Discussion.

Rev. A. B. Muzzey said that he had from childhood felt an interest in trees; his grandfather's home was nearly surrounded by them, which was a rare thing at that time. He was surprised to perceive indifference and ignorance on the part of many otherwise intelligent people in regard to tree planting. Superintendents of city streets seem uneasy as long as there is a tree that can be cut down. The chestnut tree celebrated by Longfellow stood at a point in a street where it obstructed an alderman's view, and so it had to come away; and after that the poet walked on another street. Lovers of trees have had to entreat city authorities to spare fine trees. Boston Common is now well planted with trees, which have been skillfuly set in good soil; but much too large a proportion of them are of one kind, the Linden, which is very beautiful in itself but not to be planted to the exclusion of others equally beautiful. Even in country places, where we should expect to find a love of nature and an appreciation of the beautiful, people are very careless about tree planting, and when they attempt to do something by way of improvement it is often done in so unintelligent a way as to be useless.

The subject is important under another aspect; forest destruction is going on rapidly, and the supply of lumber is diminishing. From necessity we must destroy many trees, but too many are wantonly destroyed. The speaker hoped that all present would use their influence to create a public sentiment in favor of planting and preserving trees. All have influence in regard to planting trees around their houses. In New Hampshire he had seen trees neglected by farmers, or planted so as to cut off the owner's prospect. The Sugar Maple might be planted more largely to advantage.

O. B. Hadwen said that it had been exceedingly gratifying to listen to the two papers read today, treating of subjects so near the heart of every intelligent farmer and horticulturist. Mr. Strong's list of shrubs includes the best kinds. The speaker's residence is at Worcester, at an elevation of five or six hundred feet above tide-water, and he had taken much pains in planting trees, having in the beginning all those indigenous to that part of the State. He had since added others, such as the Magnolias, Purple Beech, and Black Walnut; the latter when swaying in the wind is the

most graceful of all trees. He has a Cut-leaved Birch now twenty feet high. The Ginkgo is of slow growth but has very curious leaves. He has planted English and American oaks in variety; these are trees which we never tire of, and some of the species have leaves as glossy as if varnished. He has some of Nature's planting nearly four feet in diameter. Last winter there were two most severe ice-storms in the centre of the State, and his trees were badly broken; some a foot in diameter were broken off. The oaks retain their leaves in the winter, and these were covered with ice, adding greatly to the weight. There is a greater leverage on the limbs of the elms than in most trees; and consequently these suffered most; the White, Silver, and Sugar maples suffered somewhat, but not a limb of a Norway maple was broken. This species seems to adapt itself to all soils and situations; on the margins of streets where the soil has been taken off and the Sugar maple fails the Norway will find support. The trees form round symmetrical heads.

Mr. Appleton said he had the pleasure a short time before to pass a week in Hingham, where there are many fine trees, and called on Mr. Edmund Hersey of that town to tell about them.

Mr. Hersey said that the Holly, which is indigenous in Cohasset, near Hingham, is very beautiful, but difficult to transplant. It can be done, however, but the plants must be small. The Hemlock is most beautiful and stands the severest winters, retaining its green; he had been successful in transplanting it. The Red Cedar grows so close to the ocean as to be covered with spray; there are two varieties; that with a bluish cast should be chosen for planting. For evergreen trees, two feet high or less is large enough to transplant, and they will be sure to live. The people of Hingham have done a good deal in ornamental tree planting, with the result that they have some very beautiful trees there; this was owing to early and organized effort. He has perceived the benefit of the discussion of tree planting here, but when riding out he often sees much lack of appreciation of the beauty of trees. He once saw a beautiful pine tree, seventy-five feet high, in front of a cottage, only sixty feet from it, and standing by it was a man with an axe in his hand; he had cut the tree three-quarters down, and it was the only tree he had! This man needed to be educated. If he had been a member of this Society and attended these meetings he would not have cut the tree down.

Joseph H. Woodford said that the subject before the meeting was a most important one, and could not be emphasized too much. He had noticed the pleasing effect of tree planting, both in this country and in Europe. When, in riding over the country, we come to a place devoid of trees we think it must be a cheerless place to live in, but when we come to another where trees have been skilfully and tastefully planted we say to ourselves that this is the place we should like to live in. It is now in our power more than ever before, since a day has been set apart for the purpose, to encourage tree planting. He hoped that the approaching Arbor Day would be observed far and wide; and that town and city authorities would spend a good deal of money to give a stimulus to the observance of the day, interesting the children in the work of planting, and making a national holiday of it. It would be the best thing they could do for our country. There should be a village improvement society in every village. Every child who plants a tree in infancy will look back on it as his offspring. When a boy he brought home a load of trees from the forest and planted them by the roadside, and some of them are now two feet in diameter. He thought the Virgilia the most beautiful of all trees; there are three on Mr. John C. Chaffin's lawn in Newton, fifty feet high, which in their season are literally loaded with flowers, and with these and the ten thousand roses in bloom on the same grounds the air is filled with fragrance.

Mr. Strong said that there is no better tree than the Virgilia; the wood is very brittle but it does not suffer so much from breaking as other trees. In his observation the oak has suffered most. The Virgilia is more upright and does not hold ice so much; the inflorescence is exceedingly beautiful. He wished to give a caution in regard to the hemlock; in the wind it is one of the most tender trees we have. It is not a tree for an exposed place, suffering from the wind far more than the Norway Spruce. The Blue Spruce is more hardy than the Norway and more beautiful when young, but it is still a question whether it will be more beautiful in age.

Henry Ross confirmed the caution given by Mr. Strong in regard to the liability of the hemlock to break in the wind. He was surprised and greatly disappointed when he found it so tender, and he had also found it difficult to transplant. He would not recommend the American Chestnut; it is the dirtiest of all trees, drop-

ping first its flowers, then its leaves, and then its burs. Worst of all it attracts mischievous boys — not maliciously mischievous but knowing no more than he did when a boy. The White Oak is one of the most beautiful lawn trees, but objectionable from its habit of holding its old leaves until the last of May. When asked how large a tree to plant he has advised to put one dollar into the tree and two dollars into the preparation of the ground for it; then in five years you will have a tree worth looking at. Don't reverse the process and put two dollars into the tree and only one into the ground.

Mr. Ross thought the selection of trees by Mr. Appleton and that of shrubs by Mr. Strong both admirable. The Norway Maple is a favorite with the red squirrels, who gnaw off the bark to get at the sweet sap, as they do with the rock maples also; and this causes the branches to die. Shrubs are of great value in small grounds; in a plat of only a quarter or half an acre in extent you cannot have a great noble tree, but you can have shrubs.

Mr. Hersey said that the hemlock is very difficult to transplant when large, but seedlings not above six inches high are transplanted easily. He dug up trees five or six feet high and set them out with the greatest care ten years ago, and they have not got over the effect of the transplanting yet.

William D. Philbrick had found the hemlock very unsatisfactory as a hedge tree. He planted two hundred very beautiful ones, which after five or six years began to die off, one or two at a time. He considered the red squirrel a nuisance from its habit of destroying pears by the bushel to eat the seeds, and of robbing birds' nests in June of the eggs and young birds. One squirrel will take off a peck of pears in fifteen minutes.

Mr. Strong said that the hemlock is not very difficult to transplant when two or three feet high. The roots must not be allowed to get dry. Mr. Philbrick's trees were probably too crowded. It is a magnificent tree in a sheltered place, but it will not endure high winds.

Mr. Hadwen said that more than thirty years ago he planted large hemlock trees which he took from the woods with balls of earth, and they are now fine specimens, forty feet high. They do not like dry and gravelly soils, and are killed by severe autumn droughts. He thought it would be an excellent plan for park commissioners in cities and the selectmen of towns to give trees for

planting on Arbor Day; in Worcester the park commissioners gave over a thousand trees. People who have a tree given them will set it out when they will not buy one.

The Chairman thought the hemlock one of the most beautifnl of all the conifers; he has two or three which he would not part with on any account. He has not succeeded with the holly. He thought very highly of *Andromeda floribunda* and *A. speciosa* as early flowering shrubs. He was very much interested in the subject under discussion, and glad to do something to promote it, though in a humble way. When he began thirty years ago his elms were fifteen feet high, and now they are sixty, and his evergreens have grown proportionately. He has in his trees gray, red, and striped squirrels; and a colony of crow blackbirds, besides other birds, all of which he encourages.

Mr. Appleton said that there is in his neighborhood a bank about six hundred feet long with a northerly exposure, on which hemlocks are growing thriftily though the soil is quite gravelly, and this fact would seem to be an argument that hemlocks would do well in such locations when once established.

Mr. Hersey spoke of a gentleman who found one side of his cornfield eaten very badly; he went up with his gun and killed one red squirrel, and on opening its stomach he found in it one kernel of corn and thirty gray cut-worms.

The announcement for the next Saturday was "Horticultural Reminiscences," by Hon. Daniel Needham.

BUSINESS MEETING.

SATURDAY, March 26, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

No business being brought before the meeting, it was dissolved.

MEETING FOR DISCUSSION.

Horticultural Reminiscences.

By Hon. Daniel Needham, Groton.

Mr. President, Ladies, and Gentlemen : It is with no ordinary feeling of interest that I stand here for a brief time to address you upon a subject assigned to another — to one whose very name is synonymous with the growth, progress, and development of horticulture in America. The lips of that great good man have been sealed by death ; but the utterances of his life will forever remain to bless mankind. It is a compensating reflection that although the physical life may depart, the results of that life, like the flow of the river which has its head waters in the springs of the distant mountains, may yet go on forever. The name of Marshall P. Wilder will long continue a recognized name in every department of human industry based upon agricultural development throughout the civilized world, and his patient industry and careful studies in connection with plant life and growth will continually serve to encourage the young and aid the mature worker, in labors promotive of the interests of the husbandman.

It was in my early student life, at a boarding school in the city of Providence, that I took my first lessons in horticulture. At this school it was the prescribed duty of every male student to cultivate a small tract of land ; and for this purpose a lot of about a rod square was assigned him ; each lot bearing a distinguishing number. The student was furnished with sufficient barn-yard manure for fertilizing purposes, and was expected to exercise his own judgment in its use and application. Student labor spaded the ground thus assigned, pulverized the soil, worked in the manure, and planted the seeds. Every student exercised his own taste and judgment in the selection of the crop. It might be flowers — it might be vegetables for the table — it might be bushes for the production of small fruits, like the currant or other berries.

It was expected that this patch should be thoroughly tilled, kept free from weeds, and turned to the best account in accordance with the knowledge, skill, and industry of the student. Twice a month during the summer season there was inspection by the gardener,

and a report was made on each patch, the gardener having no knowledge of who was the keeper, and reporting solely by the number of the lot. In the season of harvest the steward would buy the products of the lot, and pay for them at the regular market price — so much a dozen for radishes, so much a quart for berries — the market price for everything produced; the product entering into the table supply for the institution. No charge was made for the use of the ground or the manure. Marks of merit, or demerit, were entered against the name of the student whose number was reported by the gardener with words of commendation or complaint.

The inducement to till this bit of land well was very great. The large plot of ground thus laid out for voluntary student work was a most interesting feature of the school. I do not remember the size of the combined lots, but I do remember that freedom from weeds and general good culture were everywhere apparent.

There were two stimulating influences brought to bear upon this student work; first, the hope of securing a good report from the gardener; second, the desire to realize as much as possible from the sale of the products. No particular hours were set apart for this labor. Any time out of school hours might be taken, at morning, noon, or night; the matter being left entirely optional with the student.

The great gains to a young man from being trained in such work are not easily computed. He is started, at the earliest physical development, in the study of great practical ideas. He is made to consider the character of soil; its preparation; its adaptation to the different sorts of vegetables or shrubs; and the planting and covering of the seed. He gains instruction by his early study of the product of the planted seed in order to distinguish it from the weeds, which start at the same time and often with a greater vigor; by his daily watching, not only for growth and against interference by the weeds, but against enemies from the animal kingdom that creep and crawl and fly; by his preparation, at maturity, of the crop for market so as to present it to the steward in an attractive form; and by the knowledge acquired of the value of market products and the time and labor necessary for their production; and he is benefited most of all by the health and vigor of body and mind imparted by the work, and by the cultivation of habits of industry, and the turning to good account

many hours in a month which might have sought in vain for an equal amount of valuable manly recreation elsewhere.

Consider how much more happily adapted to the development of a man, and to qualify him for a contest with the difficulties which every young man is to meet, was this simple training than the pastimes now popular with young men in our more modern schools and seminaries of learning. Here was the work of the gymnasium, the boat race, the base ball game, all combined in a harmonious, useful, natural, and attractive form, and exempt from the peril of broken limbs which attends the rivalries of the gymnasium; of useless straining of muscles which belongs to training for boat races; and of broken noses, fingers, and thumbs which uniformly attaches to contests of base ball.

From the gymnasium, the boat race, and the ball game there may indeed be acquired some physical training, affording partial compensation for the abnormal risks entered into; but in the culture of that little patch of soil there was always gained not only the delightful vigor which comes from out-door recreation, but a mental training enabling the student mind in after years to grasp the problem of life — already more than half solved in his early work upon the school garden.

It goes without saying, and need not be demonstrated by logic or illustrated by figures of speech, that there is physical energy enough wasted every season by the students of Harvard College to carry on a truck garden which would supply very largely the vegetable markets of the city of Boston. And would not such productive labor be better for the students in preparing them physically, mentally, and morally for the great work which all schools and universities are founded to carry on?

What better is it for the young man that he is a skilled puller at the oar, or a quick catcher of a ball? The answer is not apparent. But when it is asked what better is it for the young man that he has spaded and pulverized the soil, mixed the fertilizer, planted the seed, watched the early shoot, fought with great heroism and success weeds and worms and insects, produced and marketed a crop — you need not wait to frame a reply, for the answer is ready at your tongue's end and everybody at once acknowledges its truth.

Not that I would confine recreation for the young men solely to that obtained in work. With us at the school there were hours

enough for innocent amusements outside of the time required for garden service; and marbles and foot-ball games and old fashioned bat and ball were enjoyed with all the more relish for the practical labor expended on the soil.

The most lasting and permanent of all recollections are those associated with the land. They strengthen with increase of years, and bring back to old age bright visions of the native hearthstone. Manhood struggles through mechanical and commercial pursuits, that it may spend its declining years upon the hill-sides and meadows where cluster the memories of youth. The boy who goes out from the farm to mechanical and commercial industries looks back perhaps indifferently in the prime of his manhood to the long days of his early toil on the land; but his love of the excitements of trade abates, as age advances and the years bring gray hairs and baldness; and as, in the near future, he sees himself again owning the homestead farm and surrounded on his broad acres by his sons and grandsons.

Say what we will, the ideals of life are infinitely more to us than the realities. The ideals have made civilization. The enthusiasts who have been looked upon with pity have laid the foundations upon which all that is most useful in natural product and artificial life has been created. By the ideal we make possible the seemingly impossible; or rather it is the ideal which gives birth and existence to the real. The ideal develops manhood a thousand fold faster than the cold practical—and this same practical, however familiar and unimpressive now, was once itself an ideal.

The dreamers have made the flowers, whose odors and beauties prove the poverty of language when we attempt to put in words the ecstacy they bring; they have made the fruits, whose delicious juices invigorate humanity, and lead, through the means of the physical, the soul and mind high up in the spiritual and intellectual spheres; they have made the vegetables, which have multiplied in numbers and excellence of variety until the garden has become the best source of health and vigor.

No man sets his aim so high as the one who takes for his study the soil and its creations. To deal with natural law understandingly requires far closer study than to comprehend the mere police regulations which society and communities of men have woven into statute law.

Natural law is infinite. A few of its results in hybridization

have been observed by careful students, but it has no limits; it is on and on and on — and the most patient and painstaking observer, after the study of a long life, finds himself just entering upon the threshold of his work. Artificial diversification of fruit and flower may possibly be of modern origin, but natural hybridization has been at work since the earliest development of plant life.

It is by suggestions such as occur to the young when cultivating an intimate relation with the vegetable economy that great possibilities are generated — not only in the vegetable kingdom, but throughout the world of matter. The primary school and the co-operating higher institutions of learning can never lay the foundations of deep research in any other way. And this practical study of the soil and its productions should not be limited to young men — young women should share not only in the vigor which such practical work gives to the body, but in that which it affords to the mind. Encouragement to strive for and seek the unattained but possible is no less valuable in developing a full womanhood than in working out a complete manhood.

Many of our leading educational institutions for women are in advance of those for men, inasmuch as they insist on the performance of certain amounts of student labor in practical housekeeping — making bread, cooking meats, washing dishes, and other detail work — such as is required in the domestic economy. This has proved a most attractive feature in the education at Vassar and Wellesley, and at other great leading female seminaries in America. This might with great propriety and success be supplemented by practical horticulture, educating young ladies to produce their own flowers as well as to arrange bouquets.

So good success has attended the practical work of housekeeping as an educational measure, since its introduction into some of our institutions, that young and middle aged women who have heretofore failed to secure the benefit either of home or school training in this direction have patronized and are now patronizing cooking schools; which moreover are largely supported by well recognized leaders in society in our large American cities.

In a time when the value and necessity of this practical domestic education is almost universally acknowledged, I am quite astonished at finding a communication, published this present month, in a leading religious paper in the city of Boston, discouraging any attempt or ambition of young ladies to qualify themselves for

the duties of housekeepers. The views of the writer are expressed in a three column article, and I cannot do better than to quote some of her words, from which it will be seen that there is quite a strong opposing sentiment already in force, tending to destroy this good work which our leading female educational institutions have inaugurated with so much success and to such popular satisfaction.

The writer addresses herself to a young lady who is about to be married to a man in comfortable circumstances, and she says:—

"Have nothing but what your servants can prepare, and expect them to prepare it. Put up no jellies or preserves that you would have to make yourself. What your servants can't make, and you can't afford to buy, *do without*. So I will give you a few facts about three young ladies of my acquaintance, who married without knowing a single thing about practical housekeeping. One of them was musical, and one was artistic, and one was literary; and their mothers had — wisely mind you — spared them all drudgery. Great, however, was the chorus of dismay when they married.

All of them married well, just as you are going to marry — into circumstances where they would not have a butler or a lady's maid, but where they would have two good servants. At the end of three years, I happened to meet all three of them at luncheon. 'Well, my dears, and how have you succeeded in housekeeping?' 'Beautifully!' they all exclaimed. 'But how did you learn?' 'We haven't learned,' they exclaimed together. 'We don't know anything more today, than we did the day we were married. But we haven't had a bit of trouble.'

'Mother told me,' explained the young musician, 'that even if I did have good servants I could never manage them in the world unless they saw that I knew how to do things and could correct them. But, dear me! it didn't make a bit of difference. If Bridget brought in griddle-cakes that were too thick, I could see perfectly well that they were too thick, and I told her to take them out and thin them; and it did not in the least matter that I didn't know whether she thinned them with milk or water.'

'Know!' exclaimed the young artist. 'Why, I not only didn't know, but I made a point of not knowing. If Bridget came to me and said, "If yez plaze ma'am, can you tell me how to cook the cauliflower?" I just drew myself up very loftily, and said, with an air, "*I*? cook a cauliflower? Certainly not. I don't know how to

cook. I am an artist. *You* are the cook." And it worked just like every other law of supply and demand. I expected her to cook, and she cooked.'

Of the experience of the literary young lady, I know still more. She has now been married more than ten years. She has given every order for every meal, kept all her expenses, kept them rigidly, too, within the limit fixed by her husband as permissible, done all her marketing, and knows no more today how bread is made or how meat should look to be tender or how to judge a chicken or make a custard pie than if she had never kept a house."

This with a large amount of other matter of the same tenor, intended expressly to influence young ladies in their early domestic education, appeared in a leading religious paper of this city without one word of editorial comment, thus reaching the public with the full force of the editorial influence of the paper.

The writer of the article has announced that girls are all to marry husbands who can keep two servants. She gives no thought to the consideration that fortunes which have been inherited and have furnished the basis of early housekeeping are often swept away by some vicissitude of business relations, or by depreciation in value of real or personal property; that a young man who starts out well to do in this world's goods, even though the property has been accumulated by his own industry, may, by the fluctuations of trade, or through misplaced confidence, or by the laws of the elements over which he has no control, meet with reverses; and that he may not only become unable to keep two servants, but he may be driven to the necessity of depending solely upon his wife for all the domestic household labor.

Nor does the writer of the article quoted take into consideration the thousand and one young ladies destined to marry men who will be unable to keep any servants to aid in the domestic work. Yet any one of these young ladies is liable to read that article and be influenced by it, and to have her ideas of her later life more or less fashioned under its influence. Such an article published by an eminently respectable religious paper, entering thousands of homes, might have an influence as extensively pernicious as any of the hundreds of dime novels which would not be allowed place in the family library.

To teach the young women that the necessary practical labor of the household is so uninviting that it should be shunned and that

all attempts to master a knowledge of it should be avoided is to stimulate an abnormal desire for wealth, which in a large proportion of instances would result in hopes not realized, and happiness not secured.

The work of teaching practical housekeeping has been well begun in our female seminaries; where the great fact is wisely inculcated that every woman as well as man has work to perform; and that, in spite of diverse home conditions or other human relations, a knowledge of that work may become essential to the happiness not only of one woman but of a whole family. If practical horticulture could now be added to the curriculum, the outdoor recreation which would result would add vigor to the body, freshness to the mind, and stability to the health of the graduates of our institutions for the education of young women.

As regards the institutions established for the education of our boys and young men, it may be said that it would be unpopular and therefore inexpedient to introduce practical horticulture into them. But the practice of horticulture in all its details by boys and men need not be any less attractive, surely, than the process of dish washing and bread making and sweeping and dusting to young ladies.

Again it may be argued that the larger portion of our young men in academies and colleges are from the country, and so have had a practical schooling in the outlines of what we propose they should be taught. This argument cannot be sound, for it equally applies to the young ladies who gather at Wellesley and Vassar. They have made bread and washed dishes and swept the floors and dusted the furniture in their own rooms; nevertheless it is an almost universally accepted fact that this radical innovation upon the routine of the school has been attended with grand results.

This work of the domestic household and of horticulture in the schools we hope and believe will be widely extended and conducted in a systematic way, and the great variety of useful results to those so disciplined will never be exhausted until death.

At the present time there is a growing dislike to all physical labor among our native born population. Domestic labor has no support from the novelist among his female heroines, and the ploughboy long since ceased to be taken as his hero. The lady with waiting-maid and lackies in livery and the adventurer who is a banker or a railroad king have taken the places of the heroines and heroes

of a hundred years ago. Nevertheless if we expect to retain our preëminence as Americans we must create and cultivate a taste for physical labor among the generations which succeed us; otherwise our adopted citizens will soon rule and lead the land.

All men have an instinctive ambition to own land; and we know moreover that from some mysterious and not easily defined cause ownership of the soil has a wonderful influence in developing good citizenship, and establishing individual influence and personality. Of course the acquisition of land must be through the accumulations of industry, unless by the accident of inheritance; and the chance of long entailment by inheritance, where there is no law of primogeniture, is very small.

Our citizens of Irish birth have left the leasehold lands of Ireland, not because they could not pay the mere moiety of rental, but because they want the pleasurable satisfaction of absolute ownership. So they have come to America, and the Bridgets have gone into the kitchens, and the Patricks have gone into the field, and the savings banks of the country have been built up by their deposits. From time to time they establish marriage unions, and draw on the savings banks and buy and build homes; and in my own town, where in 1842 we had hardly an acre of land owned by a son of Erin, today we have hundreds of acres of well tilled land and scores of homes owned by these men who are not ashamed to work and who are fast becoming the owners of our soil.

Unless something is done to inspire and educate the rising and future generations of our young men to a love of the soil and its culture, we shall see the sceptre of power more and more rapidly passing from the hands of the native born and native bred Americans.

The key to power is wealth, the key to wealth is agriculture, the key to agriculture is knowledge and industry; and if the adopted citizen maintains his persistent industry, and the native born finds contentment in idleness, the future of the Republic can be easily read.

Discussion.

Rev. A. B. Muzzey was called on by the President, and said that he was fully in accord with the tone of the paper which had been read. We must sooner or later wake up to the importance of edu

cating youth in habits of industry and a knowledge of practical life. He had been surprised to see the feeling of young men in regard to manual labor. We should not think of teaching German to a person going to reside in France, nor should we fill the heads of children with things that they can never make use of, leaving them ignorant how to supply the common wants of life. He hoped to see more attention given to industrial education and hoped to see horticultural labor embodied in it. There is no greater incongruity than in training young men or women to imaginary positions which few of them will ever occupy. The training of our schools is excellent so far as the intellect is concerned. The speaker mentioned a case within his own knowledge, where a young woman after her schooling was over spent her time in reading novels from a circulating library, until she married a rich man, and then her ignorance compelled her to ask a skilful house-keeper how to take care of her home. Her marriage was a sad misfortune; her life was spent in dissatisfaction and was most unhappy, for her resources were exhausted. So with regard to young men; he had seen many a gay young man whose father had accumulated a fortune, but who had never been trained to self-reliance, unhappy for want of occupation for mind and body, It is wisely ordered that the human mind cannot be happy without employment. Young men join clubs because they feel the want of something to fill their empty minds. There is no better place to begin the greatly needed change in education than in our schools. The speaker said he was heartily interested in our industrial schools. The absence of editorial comment on the article quoted by the essayist from a religious newspaper was in effect a most pernicious comment.

Benjamin P. Ware said that a very broad subject had been opened. The essayist's description of female seminaries reminded him of what has been done for young men in our State Agricultural College. The students are taught agriculture practically, and inducements are offered to them to earn money. Poor boys who come there with little or no assistance from their parents can get a practical education. In other states there are similar colleges under similar management. It is the duty not only of our people but of our legislators, to provide practical education for our young people. The scholars in our schools have found when graduated that they knew nothing practical. There must be something wrong

in such an education as that. Our high schools graduate the sons and daughters of laboring men, and then the question with them is, What next? They have been so educated as to look for something very different from manual labor. They look about for positions; and after waiting for months may find a vacancy to teach. Boys starting in life are educated away from the idea of labor. They look for places in counting-rooms, but there are plenty of rich men's sons who will take these positions for fifty dollars a year, and others are forced to go into retail stores where they get only enough to pay for their board and clothes. The educational conditions here are revolutionized. The system of manufacturing also is entirely changed; years ago apprentices were wanted, but now they are not. Formely one man made a shoe complete, now it takes thirty-five men to make one, and each man is narrowed down to one thirty-fifth of a shoemaker. This increased facility of manufacture is a benefit to the community, but you cannot get a boy into a manufactory to learn a trade. He knew of a boy who wanted to learn the machinist's trade, and went to the foreman of a machine shop, who informed him that they did not take apprentices; and it became a question how he should get the training he desired. If it cannot be obtained in shops we must have schools to supply it.

William C. Strong said that he had been much interested in Col. Needham's paper, though it was quite different from what he had anticipated. The system of garden work in the school at Providence as pictured by the essayist was admirable; he did not feel quite sure that we had made advances on it even in the agricultural colleges. The system of stimulating the industry of the boys was excellent.

O. B. Hadwen spoke of the great value of the school at Providence described by the essayist, where he also was educated. Though only eight years old he recollected the ploughing of the ground before the spading, which was all done by the boys. These plots presented as good a garden as could be found anywhere. He planted radishes on the margin of his plot, and melons inside; and took great pride in them; flowers were also grown. This was his first experience in horticulture, and he worked early in the morning and at the recess of fifteen minutes, watching carefully the sprouting of the seeds and the progress of the plants. Such has been the advance of horticulture since then

that the whole wealth of the country fifty years ago could not have produced such an exhibition as we had in our own halls this week, and it was mostly the contribution of those who cultivated flowers for the love of them.

Robert Manning related a reminiscence of a gentleman who came into one of the dahlia shows of this Society about fifty years ago, when the culture of that gorgeous flower was carried to a greater extent than now, and was so struck with the beauty of the show that, though his time was almost incessantly occupied with commercial affairs, and though he possessed only a few square feet of garden in the rear of his city dwelling, he determined to buy a few plants. In the spring he carried out this purpose and in autumn he was repaid by a brilliant show of flowers. Another year the number was increased and he was equally successful. Delighted to find himself so well repaid (unaware that his success was entirely owing to the love which spared no pains for the welfare of his plants) he procured the newest and finest sorts, and another season not only became a competitor for the prizes but actually carried off some of them.

But with a few feet of land already over-filled there was no room for further additions to his stock, and he must either have more land or fewer plants; the latter he could not do, and another hundred feet, worth almost as many acres a few miles from the city, was added. But now other objects attracted his attention. The grand displays of fruit were so rich and inviting that he could not consent to be merely an admirer of them. So the corners of his garden were filled with young pear trees, which flourished as well as the dahlias, but made sad inroads on their territory. As time rolled on golden fruit hung from their branches, and a rich harvest crowned the labors of the cultivator of the city garden.

This zealous cultivator was JOSIAH STICKNEY, whose name is familiar to all the members of this Society. His garden then was at No. 116 Tremont Street, not far from where the Society's building in which this meeting was assembled was afterwards erected. In 1844 Mr. Stickney purchased the estate of Madam Hunt, occupying an elevation on the left bank of Charles River, in Watertown, where the mansion forms a conspicuous object to the view of travellers by the Boston and Albany Railroad, on the other side of the river. Here he formed terraces on the river bank, which he planted with pear trees. Other plantations of pear trees

were also made, and all his cultivation was done in the most thorough manner, a pond fortunately situated supplying facilities for irrigation, the importance of which was not then as well understood as now.*

Mr. Stickney was afterwards elected President of this Society, and by establishing a fund for the increase of the library became the means of its possessing the best horticultural library in this country if not in the world. Standing in the midst of this invaluable collection of books, we might say of him in the often quoted words inscribed on the monument of Sir Christopher Wren in St. Paul's Cathedral — "If you seek for his monument, look about you."

The speaker added that frequently as he looked on such exhibitions of the Society as that which closed the previous evening, he had wondered whether there might not be present some embryo cultivator, imbibing such a love of horticulture as that which produced so admirable results in Mr. Stickney's case. And the lesson he would draw from this reminiscence was that we should all strive to make our exhibitions as good as we possibly can, in order to attract those who may be thereby led to become skilful cultivators and benefactors to the Society and the community.

President Walcott, alluding to the unsuccessful effort which had been made to obtain a site on the Public Garden for a more commodious building for the use of the Society, added to the motive mentioned by the preceding speaker for making our exhibitions as good as possible, the desire to increase public interest in them, and secure the favor of the community for whatever plan might be adopted to provide more spacious halls for the exhibitions of the Society.

Mr. Manning thanked the President for supplementing his remarks, and desired to add still another reason why every one of those present and every member of the Society should do all in his power to procure enlarged rooms for the Society, viz.: that the accommodations for the library for which we are so largely indebted to Mr. Stickney's liberality are now so extremely inadequate, and are every day becoming more insufficient.

Mr. Hadwen, as Chairman of the Committee on Publication and Discussion, announced that this would be the last of the series of

* Hovey's Magazine of Horticulture, September, 1852, Vol. XVIII, p. 420.

meetings for the present season. The Committee had endeavored, and he hoped not without success, to procure such papers that the tendency of the meetings would be to elevate horticulture; and he believed that, when published complete in the TRANSACTIONS (as they had already been, partially, in weekly reports), they would be found a valuable addition to our stock of horticultural information.

The meeting then adjourned without day.

W. A. KELLERMAN.

TRANSACTIONS

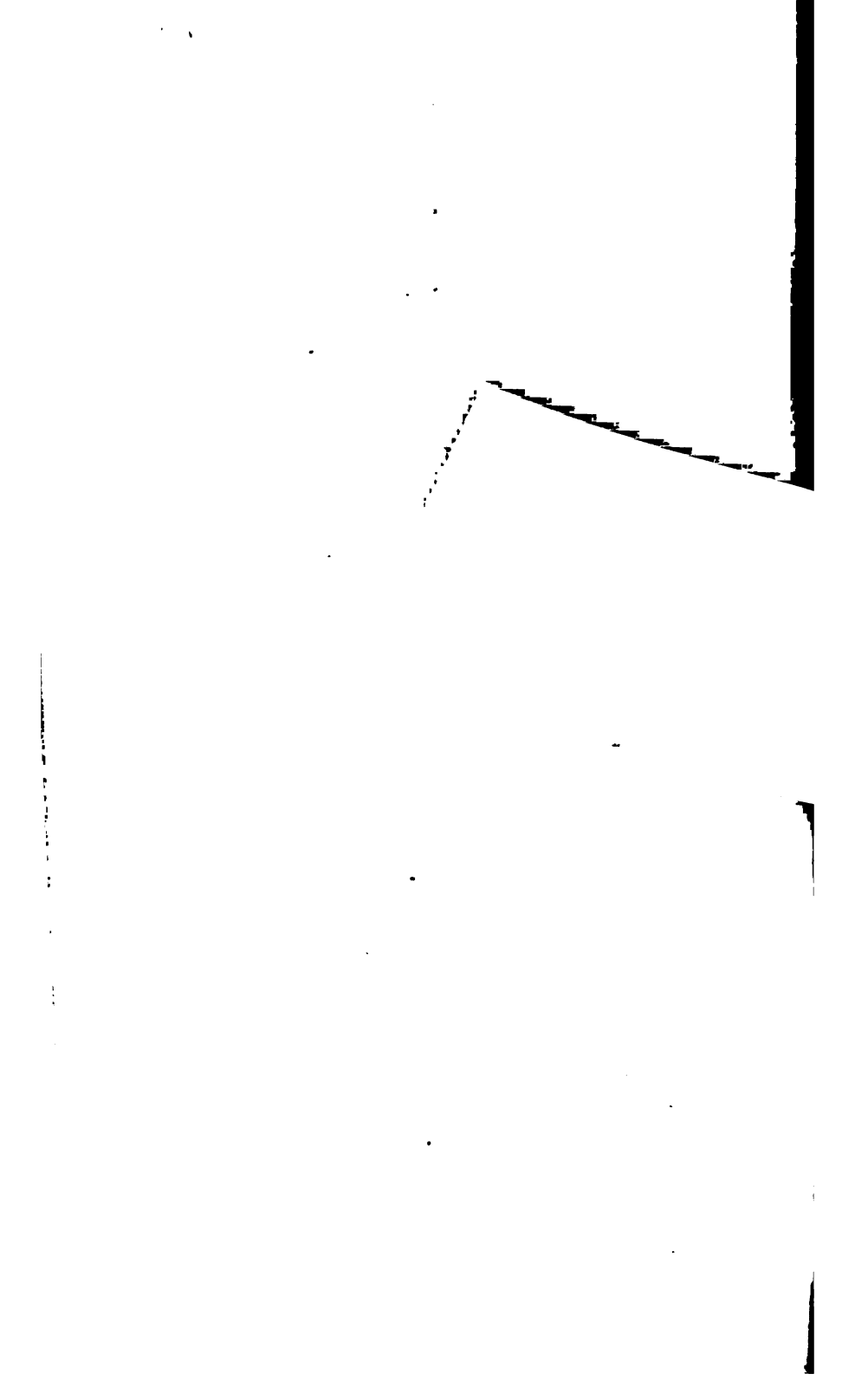
OF THE

Massachusetts Horticultural Society,

FOR THE YEAR 1887.

PART II.

BOSTON:
PRINTED FOR THE SOCIETY.
1888.



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TRANSACTIONS

OF THE

Massachusetts Horticultural Society.

BUSINESS MEETING.

SATURDAY, April 2, 1887.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The annual report of the Treasurer and that of the Finance Committee were read by the Secretary, accepted, and ordered to be placed on file.

The report of the Committee on Publication and Discussion, awarding premiums for the best reports by awarding committees, was read and accepted.

The appropriation of $100, recommended by the Executive Committee on the 26th of February, for prizes for the encouragement of Window Gardening, came up for final action, and was confirmed by the Society. The schedule of prizes for this object, presented by the Committee for Establishing Prizes, was adopted. Mrs. H. L. T. Walcott, Mrs. E. M. Gill, Mrs. L. P. Weston, Miss S. W. Story, and Mr. M. B. Faxon, having been nominated by a Committee appointed for that purpose, were elected a Committee to take charge of the exhibitions of Window Gardening, and award the prizes therefor.

On motion of William H. Spooner, it was voted that the Committee on Plants and Flowers be requested to consider the propriety of adopting the standard established by the National Rose Society of England, for roses exhibited.

Joseph H. Woodford read a communication in regard to the funds presented to the Society by Samuel Appleton, John A. Lowell, Theodore Lyman, Josiah Bradlee, Benjamin V. French, H. H. Hunnewell, Dr. William J. Walker, Josiah Stickney, and Levi Whitcomb, and offered the following votes:

Voted, That the Treasurer of this Society shall open an account with each and every permanent fund (describing the fund) on the books kept by him, crediting each fund with a fair rate of interest, to be determined by the Finance Committee annually, and charging said incomes with any awards made in prizes by the Committees established for awarding prizes.

Voted, That the Committee for Establishing Prizes be instructed to apportion these prizes according to the terms of the bequests, and that the prizes be offered under their proper headings in the next and succeeding Schedules of Prizes of this Society.

Both these votes were unanimously passed.

Mr. Woodford also moved that the following inscription be placed upon the face of the clock in the Lower Hall: "Presented to the Massachusetts Horticultural Society by John J. Low, April 5, 1845," and this vote was unanimously passed.

The following named persons, having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society:

George E. Crosby, of West Medford.
Col. Solomon Lincoln, of Boston.
James R. Pitcher, of Short Hills, N. J.
Stacy Hall, of Boston.
Francis H. Kidder, of Medford.
Charles P. Bowditch, of Jamaica Plain.

The following named persons were, upon recommendation of the Executive Committee, elected Corresponding Members of the Society:

Henry John Elwes, F. L. S., F. Z. S., Preston House, Cirencester, England.

George Maw, F. L. S., etc., Benthall, Kenley, Surrey.

W. T. Thiselton Dyer, F. R. S., Director of the Royal Botanic Garden, Kew, England.

D. Morris, Assistant Director of the Royal Botanic Garden, Kew, England.

MAXIME CORNU, Director of the Jardin des Plantes, Paris.

HENRI LEVÊQUE DE VILMORIN, Secretary of the Société Nationale d'Agriculture de France, Paris.

EDOUARD ANDRÉ, Editor-in-chief of the Revue Horticole, Paris.

CH. NAUDIN, Antibes, France.

Dr. CH. BOLLE, Berlin, Prussia.

C. J. DE MAXIMOWICZ, St. Petersburg, Russia.

CHARLES GIBB, Corresponding Secretary of the Abbotsford (Quebec) Fruit Growers' Association.

Professor D. P. PENHALLOW, Director of the Botanic Garden, Montreal.

ROBERT DOUGLAS, Waukegan, Illinois.

T. T. LYON, President of the Michigan Horticultural Society, Grand Haven.

Professor J. L. BUDD, Secretary of the Iowa Horticultural Society, Ames.

Dr. CHARLES MOHR, Mobile, Alabama.

Adjourned to Saturday, May 7.

BUSINESS MEETING.

SATURDAY, May 7, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President WILLIAM H. SPOONER in the chair.

The Chairman reported from the Executive Committee the following vote, the passage of which was recommended by the Committee:

Voted, That no Medal or Certificate of Merit shall be awarded without the written assent, at the time of award, of at least five members of the Awarding Committee, and a written statement of the reasons for the award.

The vote was unanimously carried in the affirmative.

Robert Manning announced the decease of Henry A. Breed of Lynn, one of the founders of the Society, and moved the appointment of a Committee to prepare a suitable memorial of Mr. Breed. The motion was carried, and the Chair appointed as that Committee John G. Barker, O. B. Hadwen, and Robert Manning.

George Hill announced the decease of Josiah Crosby, and moved the appointment of a Committee to prepare a memorial of him. The motion was carried, and the Chair appointed as that Committee Col. Henry W. Wilson, Charles N. Brackett, and George Hill.

The Secretary laid before the Society letters from W. Thiselton Dyer, D. Morris, Maxime Cornu, D. P. Penhallow, and T. T. Lyon, acknowledging with thanks the receipt of the notices of their election as Corresponding Members of this Society.

The following named persons, having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected:

Miss Helen Collamore, of Boston.
John Henderson, of Flushing, N. Y.
Charles Anderson, of Flushing, N. Y.
Charles F. Evans, of Philadelphia.

Adjourned to Saturday, June 4.

BUSINESS MEETING.

Saturday, June 4, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Henry P. Walcott, in the chair.

John G. Barker, Chairman of the Committee appointed at the last meeting to prepare a memorial of Henry A. Breed, reported the following:

The Massachusetts Horticultural Society views with deep emotion the departure, one by one, of those who laid its foundations and watched over its early years.

They have now to mourn the loss of Henry Allen Breed, the last but one of the sixteen gentlemen who, on the 24th of February, 1829, met in this city to establish a horticultural society; one who, in the fifty-eight years which have since elapsed, has seen the institution, then begun in weakness, grow to strength and influence; whom in recent years, after a long and eventful business career, we have welcomed at our meetings, where his presence has

testified to an unabated interest in the welfare of the Society; and who has rejoiced with us in its progress.

Yet while we lament the loss of the presence of this venerable founder of the Society at our meetings, we are consoled by the thought that his decease was not untimely, but that he "came to his grave in full age, like as a shock of corn cometh in his season," and after he had lived to see the Society attain a growth far beyond what he and his associates could have anticipated when he assisted in laying its foundations.

JOHN G. BARKER,
O. B. HADWEN,
ROBERT MANNING. } *Committee.*

Mr. Barker added that for the last fifteen years he had been intimately acquainted with Mr. Breed, and testified to his unabated interest in this Society, which he loved next to his church. He always mentioned the name of Col. Wilder with the highest respect and regard. He built the first greenhouse and laid out the first flower garden in Lynn. He was a man of great enterprise, as is shown by the fact that he laid out thirty-five streets in Lynn. He met many changes, and some very serious ones, but always rallied from them, and was always ready to promote every good work.

Robert Manning spoke of the gratification which Mr. Breed always felt in visiting the rooms of the Society and witnessing its prosperity, and of the pleasure with which he received his calls. Only a few weeks before Mr. Breed's death he stopped in Lynn on his way home, one Saturday afternoon, and gave him some flowers from the exhibition of that day, with which he was much pleased, and it was his intention to make a similar call on his eighty-ninth birthday, which would have been on the 21st of April, but he died a few days before that time.

The memorial was unanimously adopted, and it was voted that it be entered on the records, and that a copy be transmitted to the relatives of the deceased.

Col. Henry W. Wilson, Chairman of the Committee to prepare a memorial of Josiah Crosby, read the following:

Josiah Crosby was born among the hills of Ashburnham, in Worcester County, on the 6th of April, 1805, and died in Arlington, of pneumonia, after a brief illness, on the 4th of April, 1887, lacking but two days of having completed his eighty-second year.

He was the son of Frederick and Martha Maynard Crosby, and, after receiving the primitive education of the country district school of eighty years ago, was reared as a farmer. Arriving at manhood in 1826, he turned his steps toward the old town of Dorchester, whence the early settlers of his native town had gone forth, and where he continued to reside until 1834, when he married Lydia Everbeck, May 24, and removed to Roxbury, where he lived with Aaron Davis Williams. His wife Lydia died June 8, 1841, and on the 27th of December, 1842, he married Alice Ross, who survives him.

He continued to reside in Roxbury until 1847, when he removed to Arlington, where, after three years' residence, he made his home on Lake Street, at what is now known as Lake Station, where he began an experience of nearly forty years as a market gardener, in which he had no superior and few equals.

He joined the Massachusetts Horticultural Society in October, 1850, and was for fourteen years, from 1872 to 1885 inclusive, a valuable member of the Vegetable Committee. He joined the Massachusetts Agricultural Society August 17, 1867.

He was very fond of the pursuit of agriculture, in which he enjoyed an enviable reputation, and took a sincere and honest pride; he earnestly strove to attain excellence, and in the effort to improve the quality of market vegetables he originated the excellent variety of sweet corn which was named for him.

He was not a man to be interested in theology in the abstract, but he was for years a member of the Orthodox Congregational Parish of Arlington, a constant attendant at public worship, and a believer in the Christian faith, although not a communicant.

Upright and downright, with a heart free from guile, he implicitly followed the teachings of the Golden Rule, as a part of his nature, rendering to every man exact justice, and doing to all others as he would desire to be done by.

He had little taste for literature or art, and the only field sport that he enjoyed was that of rifle-shooting.

Fond of children and pets, his life flowed on serenely to its close, and the sincerity of his character was best evidenced by the attachments which were formed for him by the men of a younger generation.

Lamenting as he did in later years the defects of his early education, he was constant in his efforts to aid in the improvement of

others; and the only public office which he ever held was upon the School Committee of Arlington, to which he was elected for twenty-one consecutive years, and in his honor the Crosby School was named.

Nine children and four grandchildren survive him.

His funeral, at his late residence, April 6, 1887, was attended by a delegation of the Massachusetts Horticultural Society, and his remains were interred in the Mount Pleasant Cemetery of Arlington.

In view of his many excellencies as a man, together with his long continued and useful services to this Society and to the science of horticulture, the Massachusetts Horticultural Society desires to express its appreciation of his worth; and although his life was spared beyond the allotted span and he died full of years, yet it sincerely deplores and mourns his loss.

In the death of Josiah Crosby the Society loses a member whose labors as a horticulturist had been very successful, and whose disinterested efforts to advance the interests of the Society had been manifested during many years and in many ways.

In testimony whereof your Committee recommend that the Secretary be directed to enter this expression of regard upon the records of the Society, and transmit a copy to the family of our deceased friend; also to preserve this memorial of his life in the files of the Society.

Respectfully submitted,

HENRY W. WILSON,
GEORGE HILL,
C. N. BRACKETT. } *Committee.*

The memorial was unanimously adopted.

The vote passed at the last meeting of the Society, concerning the award of medals, appearing to conflict with the Constitution and By-Laws, was, on motion of William C. Strong, reconsidered.

Mr. Strong then moved that a Committee of five be appointed to consider what amendments to the Constitution and By-Laws, in regard to the award of medals, the various funds given to the Society, or other points, might be necessary. After discussion by Mr. Strong, Joseph H. Woodford, John C. Hovey, William H. Spooner, and O. B. Hadwen, the motion was carried, and the Chair

appointed as the Committee, William C. Strong, William H. Spooner, E. W. Wood, Solomon Lincoln, and John B. Moore.

The Secretary laid before the Society letters from Henry J. Elwes, Ch. Naudin, and C. J. Maximowicz, accepting with thanks the Corresponding Memberships to which they had been elected.

GEORGE G. TARBELL, M. D., of Boston,

having been recommended by the Executive Committee, was, on ballot, duly elected a member of the Society.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, July 2, 1887.

A duly notified stated meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the Chair.

William C. Strong, Chairman of the Committee appointed at the last meeting to consider what amendments to the Constitution and By-Laws, in regard to the award of medals, the various funds given to the Society, or other points, might be necessary, made the following report:

The Committee appointed to consider the subject of the donations and legacies left to the Society, and the award of medals from such funds, together with any proposed alterations of the By-Laws, report as follows:

The aggregate amount of donations and legacies, up to the present date, is about $50,000.

With the exception of the Josiah Stickney fund of $12,000, the use of which until the year 1899 is conditioned to the purchase of books for the library, all the other gifts are absolute. In most cases they are conditioned to be invested as permanent funds, the income of which is to be devoted by the Society to prizes for the cultivation of fruits, flowers, and vegetables, in general. Special objects are designated in a few instances, as, for example, the French fund for Apples, the Hunnewell funds for Evergreen trees,

for Estates, and for Rhododendrons, and the Walker fund for Vegetables.

But the manner of awarding the income is in no case limited, and is entirely within the discretion of the Society. In most cases, however, the desire has been expressed by the donor that the gift should be invested as a permanent fund, the income of which should be expended in prizes. In one instance the request is made that the gift "shall be kept entirely distinct from all other funds of the Society for the specific purpose designated." When the present real estate and building of the Society was obtained, it was thought advisable that the funds of the Society should be applied towards its payments. No one can doubt the permanence or the safety of this investment. But by such disposal these donations become apparently merged with the general funds of the Society, and the annual income therefrom can only be approximately determined. As a result of this commingling, the custom has grown from year to year of awarding prizes from the general fund alone, without specifying in our Schedule of Prizes the various funds from which the prizes are drawn. In cases where the gifts have been small, and have not been limited, it cannot be expected that separate prizes can be mentioned, yet simple justice to the memory of the donors requires that we should modify our present method of awards.

It is not doubted that the donations may be legally invested with our other funds in the real estate of the Society. Yet it is evident that the intent of the donors would be more perfectly answered if the amount of their gifts were separately invested, and the annual income, which could then be more definitely determined, should be distinctly appropriated in prizes and medals.

Your Committee, therefore, advise the Society to recommend to the Finance Committee the separate investment of such moneys as have been given to the Society as permanent funds; such separate investment to be made whenever the Finance Committee shall deem that it can be done advantageously.

Your Committee also recommend that the following words be added to the vote passed April 2d, on motion of Mr. Woodford: "and the names of the donors of the funds from which the prizes are derived be connected with such prizes"—so that the vote as a whole shall read as follows:

Voted, That the Committee for Establishing Prizes be instructed

to apportion these prizes according to the terms of the bequests, and that the prizes be offered under their proper headings in the next and succeeding Schedules of Prizes of this Society, and that the names of the donors of the funds from which these prizes are derived be connected with such prizes.

In regard to medals and plates, your Committee find that there are no conditions or restrictions in any of the gifts to the Society, and therefore that their award is entirely at the option of the Society. The cost of such medals must of course be taken from the annual appropriations. To determine the amount to be deducted from the appropriations for such awards, your Committee recommend the establishment of the following values, respectively:

For the Bronze Medals,	a value of	$3.00
For the Society's Silver Medal,	"	5.00
For the Appleton Gold Medal,	"	50.00
For the Society's Gold Medal,	"	75.00

It has been found that many candidates who have been proposed for membership have neglected to qualify themselves for a considerable time after their election. To remedy this evil your Committee recommend the addition of the following words to Section XXIV of the By-Laws:

"The candidate for membership shall qualify himself for membership within six months from the date when notice is given of his election."

W. C. Strong,
W. H. Spooner,
E. W. Wood,
Solomon Lincoln,
John B. Moore. } *Committee.*

The report was accepted, and Mr. Strong moved that the question be taken separately on the votes recommended therein. This motion was carried, and the question was put as follows:

First, on the recommendation to the Finance Committee concerning the investment of funds.

Second, on the amendment to the vote passed at the meeting on the 2d of April, concerning the offering of prizes from the funds donated to the Society.

Third, on the recommendation to establish the values of medals.

These recommendations were all unanimously adopted.

The amendment to the Constitution and By-Laws recommended by the Committee was, after two readings, approved by a majority vote, and laid over for consideration at the quarterly meeting in October.

The President, as Chairman of the Executive Committee, reported in regard to limiting the number of annual members of the Society, that subject having been referred to the Committee at the meeting on the 1st of January, that no action was desirable.

The Secretary laid before the Society a letter from Charles Gibb, acknowledging and accepting with thanks the Corresponding Membership to which he was elected.

J. Woodward Manning, of Reading,

having been recommended by the Executive Committee, was, on ballot, duly elected a member of the Society.

Adjourned to Saturday, August 6.

BUSINESS MEETING.

Saturday, August 6, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, Henry P. Walcott, in the chair.

Agreeably to the Constitution and By-Laws, the President appointed the following Committee to nominate suitable candidates for the various offices of the Society for the year 1888:

William C. Strong, Chairman; William H. Spooner, John C. Hovey, Francis H. Appleton, Patrick Norton, George Hill, Samuel Hartwell.

Charles E. Maxwell, of Boston,

having been recommended by the Executive Committee as a member of the Society, was, on ballot, duly elected.

Adjourned to Saturday, September 3.

BUSINESS MEETING.

SATURDAY, September 3, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

President Walcott said that before proceeding to other business, he wished to make the official announcement of what was doubtless known to all those present — the decease, since the last meeting of the Society, of two of its Ex-Presidents, John B. Moore and Charles M. Hovey.

Ex-President Moore died at his residence in Concord, on Sunday, the 21st of August. The speaker desired to say that he looked back to a pleasant intercourse with him. What most impressed him was the manliness of the man; his sturdy frame was an index to what was in him. He was not unduly elated with success; and the reverses which come to all were met by him with manly courage. In all his horticultural operations he illustrated the benefit of thorough cultivation. He was prominent not only in this Society, but as a member for many years of the State Board of Agriculture. He was for a long time a Deputy Sheriff of Middlesex County, and also a member of the Board of Prison Commissioners; and the speaker had abundant opportunity, from his own official position, to know that the duties of the last-mentioned office were discharged by him with signal ability and success. He felt that honors conferred upon him involved obligations.

Mr. Hovey died at his residence in Cambridge on Thursday, September 1. Of him it is difficult to speak otherwise than in connection with this Society, especially in this building, erected during his presidency, and largely due to his energy and perseverance. He was a man of very distinct convictions and very energetic ways of stating them. Perhaps at the time of his death there was no other name of so much consequence connected with American horticulture. The Magazine of Horticulture, which he commenced when a young man and published for thirty-four years, is a record and a monument such as no other horticulturist on this continent has left behind him.

O. B. Hadwen moved that a committee of five be appointed by the chair to prepare resolutions in memory of Ex-President Moore.

The motion was unanimously adopted by a rising vote, and the President appointed as that Committee, Ex-President James F. C. Hyde, O. B. Hadwen, C. H. B. Breck, John C. Hovey, and E. W. Wood.

William C. Strong said that there seemed to be a strange fatality among the officers of this Society; within three years a President and four Ex-Presidents had died. Only a fortnight ago he called on Ex-President Hovey, and was glad to find him better than he had expected to. Mr. Hovey then spoke most kindly of the Society and of the members. Mr. Strong closed by moving that a Committee of five be appointed by the Chair to prepare a memorial of Ex-President Hovey.

This motion also was unanimously adopted by a rising vote, and Ex-President William C. Strong, William H. Spooner, Charles L. Flint, Col. Henry Wilson, and Robert Manning, were appointed as the Committee.

Col. Henry W. Wilson moved that the officers of the Society, with ten other members to be appointed by the Chair, be a Committee to represent the Society at the funeral of Ex-President Hovey the next day. This motion was unanimously carried, and the chair appointed the Ex-Presidents,

James F. C. Hyde, William C. Strong,
Francis Parkman,

and the following members:

H. H. Hunnewell, Henry Wilson,
Charles L. Flint, O. B. Hadwen,
E. W. Wood, Patrick Norton,
Charles N. Brackett.

Mr. Strong, as Chairman of the Committee to nominate candidates for officers and standing committees for the next year, reported a list, which was accepted. It was voted that the Committee be continued and requested to nominate candidates in place of any who might decline before the election.

Col. Wilson, as Chairman of the Committee appointed to procure portraits of Hon. Francis B. Hayes and John B. Moore, to continue the series of portraits of the Presidents of the Society, made a concluding statement that they had attended to that duty. There was some delay in obtaining the portrait of President Hayes,

owing to the fact that the Committee thought that a bust might be obtained, but in this they were disappointed, and also owing to the fact that the first portrait painted was not satisfactory. A second one had been procured, without expense to the Society, which was suspended on the wall in view of those present.

The report was accepted and the Committee was discharged.

The Treasurer reported that he had received from the executors of the will of Ex-President Marshall P. Wilder, the sum of $1000, and also the Large Gold Medal awarded to him by the United States Agricultural Society, January 14, 1860, and by him bequeathed to this Society. The medal was presented at the meeting, and it was voted that the acceptance of these bequests and the conditions thereof be entered on the records of the Society.

The clause of Mr. Wilder's will relating to these bequests is as follows:

"Tenth. I give to the Massachusetts Horticultural Society the sum of one thousand dollars, to constitute a fund, the income of which shall be annually offered in special prizes, as follows: one-half of the income shall be offered annually in prizes for grapes of American origin; the other half of the income in prizes for the pear. These prizes shall be known as the 'Marshall P. Wilder prizes.' I also give to said Society the large Gold Medal of Honor presented to me by the United States Agricultural Society."

[The Gold Medal bequeathed by Mr. Wilder was deposited in the safe of H. H. Hunnewell, Chairman of the Finance Committee, as per his receipt on file with the Treasurer, dated October 1, 1887, — the Society's safe in the Boston Safe Deposit and Trust Company's vaults being too small to receive the case.]

THOMAS DOLIBER, of Roxbury, and
WARREN S. FROST, of Belmont,

having been recommended by the Executive Committee, were, on ballot, duly elected members of the Society.

The meeting was then dissolved.

BUSINESS MEETING.

SATURDAY, October 1, 1887.

A stated meeting of the Society, being the Annual Meeting for the choice of officers and standing committees, was holden at 11 o'clock, Vice-President C. H. B. BRECK in the chair.

The Recording Secretary being absent, owing to illness, the Chair appointed Edward Frost Recording Secretary *pro tempore*, who stated that the requirements of the Constitution and By-Laws in regard to notice of the meeting had been complied with.

In behalf of the Committee appointed to prepare a memorial of the late Charles M. Hovey, William C. Strong, Chairman, reported as follows:

The Committee appointed to prepare an expression from the Society in memory of the late Charles M. Hovey, submit the following:

The Massachusetts Horticultural Society desires to place on record its appreciation of the eminent ability and life-long service of the late Charles M. Hovey in the cause of horticulture and the interests of this Society. From very boyhood Mr. Hovey is said to have displayed a love of this art. At the early age of twenty-two, in the year 1832, he established his nurseries in Cambridge in connection with his brother, retaining this as his principal pursuit with unflagging interest until the day of his death.

During this long period of fifty-five years, what a vast amount of service did he render! What revolutions in the art did he witness! To him the high honor must be accorded of having contributed as much as any other man towards advancing the interests of horticulture to the present stage of progress. A man of ceaseless activity, untiring energy, keen observation, retentive memory, boundless enthusiasm, he brought to his work qualities which ensured progress. The many products of his skill were as sure to appear as the ripe fruit is sure to follow the careful culture of the seed. In every branch of cultivation, native or exotic, fruits or flowers, trees or plants, he was equally interested; and the results of his labors are seen in seedlings or valuable introductions in all departments of plants.

Such activity would exhaust the strength of most men. But

not content with this, in the year 1835, when only twenty-four years old, Mr. Hovey began the publication of the "Magazine of Horticulture," the first successful periodical of its kind in this country. For thirty-four years he continued its editor, giving a vast amount of original matter, together with full reports of the exhibitions and transactions of this Society. This work will remain as a lasting monument to his industry and ability, which alone would reflect high honor. In 1848 he began the publication of the "Fruits of America," illustrating in several volumes the fruits and the trees of this country as sketched by himself from nature.

Notwithstanding the incessant tax upon his time from these various departments of labor, he yet found ways to make himself familiar with the current literature of the old world relating to his various pursuits. His well read library was probably as complete as any other private library in the land upon these subjects. Considering his long life devoted exclusively to this pursuit, it may be doubted whether any other man in this country has done so much to stimulate a love of horticulture in all its branches.

Mr. Hovey joined this Society in September, 1833, four years after its organization.

He served as Librarian three years, from 1834 to 1836.

He served on the Library Committee from 1834 to 1859, being Chairman from 1843 to 1859.

He was on the Committee on Flowers and Shrubs from 1835 to 1842, and for the last two of these years was Chairman.

He was elected on the Executive Committee for 1842, 1843, and 1862, and also was *ex-officio* on this Committee from 1863 to 1885.

He was elected on the Committee to Establish Prizes for the years 1847, 1848, and 1849.

On the Committee on Synonyms of Fruit from 1847 to 1849, and also from 1857 to 1866.

On the Fruit Committee from 1850 to 1859.

On the Committee on Publication from 1853 to 1859.

He was elected Vice-President for 1858 and 1859.

He was elected President for the year 1863, and re-elected, holding that office for four successive years.

It was during his term of office and owing largely to his persistent advocacy that the site for our present Hall was secured and the building erected.

Such were the offices which he held and the employments which indicate a life of ceaseless and untiring activity. For long years and in many ways did he stimulate others while he lived to a like enthusiasm in the cultivation of Nature. May the memory of his zeal and ability be an inspiration to those who shall follow him.

The Secretary is hereby directed to forward a copy of this record to the family of the deceased, with the expression of the sincere sympathy of the Society in their sorrow.

WILLIAM C. STRONG,
WILLIAM H. SPOONER,
CHARLES L. FLINT,
HENRY W. WILSON,
ROBERT MANNING. } *Committee.*

After further appropriate remarks offered by Mr. Strong, in moving the adoption of the memorial, it was unanimously adopted and ordered to be entered on the records of the Society.

The Committee to prepare a memorial of the late John B. Moore, asked and were granted further time in which to report.

The Chair announced that the regular business of the meeting, being the election of officers and standing committees for the ensuing year, would now be proceeded with, and, agreeably to the Constitution and By-Laws, appointed William H. Spooner, Marshall B. Faxon, and Edward Frost, a Committee to receive, assort, and count the votes given and report the number.

The polls were opened at thirty minutes past eleven o'clock, and the Chair announced that they would remain open one hour, also that a check list would be used containing the names of those entitled to vote.

The Recording Secretary *pro-tem* laid before the Society a letter from the Royal Union for the Cultivation of Flower Roots, Haarlem, Netherlands, in regard to medals to be offered as prizes for flowering bulbs at the Spring Exhibition of this Society in 1888. On motion of Mr. Strong it was voted to accept the proposals contained in the letter, and that notice of acceptance should be communicated to the Royal Union. It was also voted that the Committee on Establishing Prizes, *elect*, be requested to prepare a list of prizes for bulbs at the exhibitions in 1888, and report the same at the next meeting.

The amendment to the Constitution and By-Laws proposed at

the Stated Meeting on the 2d of July, and then ordered to be entered on the records, came up for final action, and on motion of Mr. Strong was unanimously adopted, as follows:

To be added to Section XXIV:

"The candidate for membership shall qualify himself for membership within six months from the date when notice is given of his election."

Mrs. H. L. T. Wolcott, followed by M. B. Faxon, read remarks and other matter in the nature of a report of the Committee on Window Gardening appointed April 2, 1887, and a plea for the continuance of its work. Mr. Faxon concluded by offering the following amendments to the Constitution and By-Laws:

That Section XXI of the Constitution and By-Laws be amended so as to include a Committee on Window Gardening, and so that the first clause of said section, as amended, shall read as follows:

"These Committees shall be the Committee on Fruits, the Committee on Plants and Flowers, the Committee on Vegetables, the Committee on Gardens, and the Committee on Window Gardening."

And that Section XX of the Constitution and By-Laws be amended by adding to the Committee for Establishing Prizes the Chairman of the Committee on Window Gardening, and reducing the number of additional members, not Chairmen of Committees, from three to two, so that the first portion of said section, as amended, shall read as follows:

"This Committee shall consist of the Chairmen of the Committees on Fruits, Plants and Flowers, Vegetables, Gardens, and Window Gardening, and two other members, who shall be chosen as provided in Section III."

The foregoing amendments having been read a second time by the presiding officer, and being seconded by Benjamin G. Smith, were unanimously passed to be entered on the records for consideration at the Stated Meeting in January next.

THADDEUS WILLIAM HARRIS, A. M., of Cambridge, and
WILLIAM H. HILLS, of Plaistow, N. H.,

having been recommended by the Executive Committee as members of the Society, were, on ballot, duly elected.

The polls were closed at thirty minutes past twelve o'clock, and the Committee to receive, assort, and count the votes, after attending to that duty, reported

The whole number of ballots to be 41.
Necessary for a choice 21.

The report of the Committee was accepted, and the persons reported as having the number of ballots necessary for a choice were, agreeably to the Constitution and By-Laws, declared by the presiding officer to have a majority of votes, and to be elected Officers and Standing Committees of the Society for the year 1888.

Adjourned to Saturday, November 5.

BUSINESS MEETING.

SATURDAY, November 5, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, Vice-President Spooner in the chair.

Ex-President James F. C. Hyde, Chairman of the Committee to prepare a memorial of Ex-President John B. Moore, reported the following:

WHEREAS, in the providence of God, our late Ex-President, John B. Moore, has been called from his labors here on earth, therefore

Resolved, That in the removal of our late associate who has faithfully filled many positions in this Society, including its highest office, we have suffered a great loss.

Resolved, That not alone is the loss felt by the members of this Society, but by the whole community, among whom he was well known and highly respected for his active and useful life.

Resolved, That he will be long and deservedly remembered for the great benefit he has conferred upon the public by his successful efforts in the promotion of Agriculture and Horticulture, as well as by his useful labors in many other important matters.

Resolved, That his example as an intelligent, enthusiastic, and indefatigable worker in the great field of nature is worthy of imitation by all who are striving for success.

Resolved, That we tender to the bereaved family of our late associate, our warmest sympathy in this time of grief, at the loss of one so dear to them, and assure them that we shall long remem-

ber his many excellent qualities and the pleasant relations that have existed between us.

Resolved, That these resolutions be entered upon the records of the Society, and a copy be sent to the family of the deceased.

JAMES F. C. HYDE,
O. B. HADWEN,
C. H. B. BRECK,
JOHN C. HOVEY,
E. W. WOOD.
} *Committee.*

Mr. Hyde added that he had long known Mr. Moore and had been associated with him six years on the State Board of Agriculture. As a horticulturist he was eminently successful. He was a very useful man in the community, and in his death the public, as well as the Society, suffers a great loss, but he had reached an age when he could not be expected to continue long. His death, with that of Mr. Hovey, which followed soon after, leaves only three surviving Ex-Presidents of the Society.

O. B. Hadwen seconded the adoption of the resolutions, and said that he had known Mr. Moore for many years, and had been for twelve years a member of the State Board of Agriculture with him, and had known of his valuable work. Whatever he made a speciality of, he stood at the head of all cultivators of that flower or fruit, and in our exhibitions no one could beat him. His shows were of great benefit to that department of the Society's work; all have profited by them as well as by visits to his grounds, and in his death we have lost one of our most valuable men.

William C. Strong said that Mr. Moore hardly needed the tributes which had been paid him, for he was known by his fruits, yet he could not but express his sympathy with what had been said. One of his most marked characteristics was that he did all things thoroughly. He was a genial man, and the speaker recalled many pleasant interviews and social chats with him. We shall long cherish his memory, and especially the example of his cultivation.

The resolutions were unanimously passed.

The Chairman of the meeting reported from the Executive Committee a recommendation that the Society appropriate $6,000 for prizes and and gratuities for the year 1888, and that the attention of the various committees be called to the careful consideration of the possibility of making some reduction in the Schedule of

Prizes. Agreeably to the Constitution and By-Laws this recommendation was laid over until the stated meeting in January.

On motion of Robert Manning it was voted that agreeably to the rules of the State Board of Agriculture, three prizes of $10, $8, and $6, be offered for the best reports of awarding committees.

LEANDER BEAL, of Boston,

having been recommended by the Executive Committee as a member of the Society, was, upon ballot, duly elected.

Adjourned to Saturday, December 3.

BUSINESS MEETING.

SATURDAY, December 3, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The Annual Report of the Committee on Plants and Flowers was read by Joseph H. Woodford, Chairman, accepted, and referred to the Committee on Publication.

The Annual Report of the Committee on Fruits was read by E. W. Wood, Chairman, accepted, and referred to the Committee on Publication.

The Annual Report of the Committee on Vegetables was read by Charles N. Brackett, Chairman, accepted, and referred to the Committee on Publication.

The Report of the Special Committee on Window Gardening was read by M. B. Faxon, Secretary, accepted and referred to the Committee on Publication.

The President, in behalf of the Executive Committee, submitted the Schedule of Prizes for the year 1888, as prepared by the Committee for Establishing Prizes; which was referred back for a conference between the two Committees in regard to certain points.

On motion of William H. Spooner, it was voted that in compliance with the laws of the Commonwealth a prize of $10 be offered for the best plantation of trees for ship timber, and that this offer be printed in the Schedule of Prizes for 1888.

The Secretary read a letter from John H. Moore, acknowledging the resolutions passed by the Society in memory of his father, the late John B. Moore, and in behalf of himself and the family thanking the Society therefor.

The Secretary also read a letter from the Secretary of the State Board of Agriculture, stating that the term of office of the delegate from the Society to the Board of Agriculture would expire at the close of the present year. On motion of John G. Barker the present delegate, E. W. Wood, was re-elected.

DANIEL G. WALTON, of Wakefield,

having been recommended by the Executive Committee, was, on ballot, duly elected a member of the Society.

Adjourned to Saturday, December 10.

BUSINESS MEETING.

SATURDAY, December 10, 1887.

An adjourned meeting of the Society was holden at 11 o'clock, the President, HENRY P. WALCOTT, in the chair.

The Annual Report of the Library Committee was read by William E. Endicott, Chairman, accepted, and referred to the Committee on Publication.

Robert Manning read his Annual Report as Secretary and Librarian, which was accepted and referred to the Committee on Publication.

The President, as Chairman of the Executive Committee, presented the Schedule of Prizes for the year 1888, with the approval of that Committee, certain changes having been made in it in conference with the Committee for Establishing Prizes. The Schedule was adopted and ordered to be printed.

The meeting was then dissolved.

REPORT

OF THE

COMMITTEE ON PLANTS AND FLOWERS,

FOR THE YEAR 1887.

By JOSEPH H. WOODFORD, CHAIRMAN.

In submitting the Report of our doings for the past year, it may not be too much to say that our Society is conceded to be the most active of all the similar institutions in the country in promoting a love for the beautiful among the masses of the people. For over fifty years it has been continually doing this great work of beneficence; and as the years roll away we become more and more assured of the wide-spread benefits conferred on this community by our liberality. The horticultural education, which is yearly disseminated by this Society and absorbed by the public, is a power for good, appreciated only by those who come in actual contact as participants, with the great work we are doing. The love of flower culture is probably the most refining influence which can be developed in any community, and as our institution pre-eminently fosters the love of flowers and gardening, we may be considered as amongst the great moral educators of the people.

We see an increased love of flowers manifested by the attendance at our weekly exhibitions, and by the quantity of flowers exposed for sale on the street or in the flower stores; both greater than ever before. Reaching as we do by our influence all classes of the people, we are doing all in our power to extend and develop among them a love of the useful and beautiful in nature, so that these may be availed of to the fullest extent of their beneficence.

The exhibitions during the year have been well attended and generally successful. To make a proper report of them it will be

well to review them in order, for this will afford an account more in accordance with the actual experiences of your Committee than if we condense our report into a general review of the whole year.

SPRING EXHIBITION.

March 23, 24, and 25.

This great exhibition was of unusual excellence. Special pains had been taken in the arrangement of the Halls, to make the show both natural and attractive. The Lower Hall was made to represent a garden in the spring time of the year, which was charmingly arranged by W. A. Manda with plants from the Botanic Garden of Harvard College. This was a new feature in our exhibitions, and was a grand innovation; it showed an immense variety of hardy perennial and spring flowering plants as growing quite naturally among the rocks, moss, and ferns of a wild garden. The effect produced was very pleasing and elicited favorable comments from the numerous visitors in attendance.

The Upper Hall was completely filled with plants and flowers gathered from the four quarters of the globe; but when we attempt to point out the best of the exhibits, we are confronted with the fact that all were good. Perhaps the most striking floral effect produced was the grand exhibition of flowering bulbs brought out by the liberal premiums of gold, gilt, and silver medals offered by the Royal Union of Holland for the promotion of the culture of Holland bulbs, and also by the liberal prizes offered by our own Society. The arrangement was good and the display was most effective. The Dutch Gold Medal was awarded to Nathaniel T. Kidder for fifty Hyacinths, and the Silver Gilt and Silver Medals were awarded to Charles H. Hovey for two collections, each of fifty Hyacinths. Charles H. Hovey was awarded the Silver Gilt Medal for twenty pots of Polyanthus Narcissus, and Charles M. Hovey was awarded the Silver Medal for twenty pots of Polyanthus Narcissus. The third prize was not awarded.

Tulips were not quite up to the standard of last year, therefore the first prize was not awarded. Charles H. Hovey took the Silver Medal for twenty-five pots, and Charles M. Hovey the Bronze Medal for twenty-five pots.

The show of Orchids, in quantity, quality, and extensive variety,

was undoubtedly the finest ever seen in this city. The arrangement made of them was very natural, as they were mostly suspended from the branches of trees hung with Spanish moss, which in many cases gave them the appearance of growing in their native forests.

The Roses, Azaleas, and other plants were very beautiful, and the wonderful amount of fragrance emitted from so many lovely flowers, and sweet smelling plants, was at times almost overpowering. To show better than we can otherwise express it the appreciation which one lady had of this exhibition, we will here state that, during the afternoon of the last day the show was open, she bought tickets for a school of seventy young ladies. These contributed by their graceful presence an additional enchantment to the scene. Their delight was unbounded and their expressions of it were very enthusiastic.

The new roses, Papa Gontier and Puritan, were brought into prominent notice for the first time at this show, and to each was awarded the Society's Silver Medal for excellence.

RHODODENDRON SHOW.

June 4.

The exhibition of Rhododendrons, owing to the lateness of the season, was not up to the high standard attained last year; yet it was a highly commendable show, and the exhibitors were rewarded by a large attendance. The most extensive contributors were H. H. Hunnewell and Mrs. Francis B. Hayes.

On the 11th of June, the display of rhododendrons was even better than on prize day, and the show of other flowers in their season was quite extensive. The Arnold Arboretum, by the hand of Jackson Dawson, contributed a large collection of new shrubs, as follows:

Rosa spinosissima pencillata.

" " *rubra.*

Rosa pumila, an Alpine species growing not more than a foot high.

Rosa Arkansana.

Whipplea modesta, from Texas.

Vaccinium staurinum, from Western Massachusetts; very pretty.

Azalea calendulacca, from seed from the mountains of North Carolina, and as beautiful as the garden varieties.

Hudsonia tomentosa, from Plymouth.

Viburnum cassinoides, from Vermont.

Rhododendron ferrugineum, Alpine.

Ceanothus ovatus, from Vermont.

Jamesia Americana, from the Rocky mountains.

Lonicera perfoliata, received under this name but probably a variety of *L. Periclymenum*.

Cornus circinata, from the northern and western parts of this state; beautiful in flower and fruit, the latter being white.

A species of Amelanchier, having wreaths of white flowers when exhibited, and scarlet fruit in autumn.

ROSE EXHIBITION.

June 21 and 22.

The great Rose Show was thought by some to surpass that of last year, and was conceded by all to be a grand display of this most beautiful flower. The prizes were more widely distributed than formerly, which demonstrates the fact that more attention to cultivation is now generally given and more skilful methods are adopted by gardeners, enabling a larger number to grow the "Queen of the Garden" to a high degree of perfection. All classes of growers were represented. The botanist was given an opportunity to study about forty different species collected by the Arnold Arboretum from all over the world, — the amateur an occasion to remark upon his brother amateur's success in taking prizes, — and the gardener a chance to show his supremacy in the art of growing this imperious Queen. Both the halls were well filled with beautiful roses and other plants and flowers, and the exhibition as a whole was a most pleasing and successful one.

WEEKLY EXHIBITIONS.

The Weekly Flower Shows beginning July 2 and ending September 3 were very good; and as exhibiting the different flowers, each in its natural season, they were very instructive to a large number of visitors of different ages and classes.

Worthy of special mention were

Delphiniums,	grown by	Edwin Fewkes & Son;
Sweet Peas,	" "	J. F. C. Hyde;
Gladioli,	" "	H. B. Watt;
"	" "	J. W. Clark;
Herbaceous Plants,	" "	William J. Martin;
" "	" "	J. W. Manning;
and Pompon Dahlias,	" "	George S. Tuttle.

The weekly displays of native plants collected by Mrs. P. D. Richards, formed a striking educational feature of our shows, not to be passed over without notice.

ANNUAL EXHIBITION.

September 13, 14, 15 and 16.

The Annual Exhibition was held this year in the Great Hall of the Mechanics' Charitable Association building, on Huntington Avenue, and in connection with the biennial session of the American Pomological Society. Ample space was allotted to the Flower Committee for the display of plants and flowers, and the artistic grouping of the specimens presented has never been surpassed in any of our shows. The plants were of the most rare and beautiful species, and profuse in quantity; and each was a well grown specimen of its kind. Each exhibitor was apportioned a suitable space of floor room on which to group his plants, and when all was completed the great hall presented the appearance of a grand tropical garden covering a space of about twenty thousand square feet in extent.

The large tanks of Water Lilies from John Simpkins, were a splendid feature of the exhibition, as they comprised specimens from all parts of the world, and of all sizes, ranging from our smallest *Nymphœa odorata*, to the magnificent lily of the River Amazon, the world-renowned *Victoria regia*.

The principal contributors of plants were H. H. Hunnewell, N. T. Kidder, George A. Nickerson, John L. Gardner, Mrs. Francis B. Hayes, W. A. Manda, Thomas Clark, and Charles H. Hovey. Taking it all together it was pre-eminently the best display of plants and flowers ever made in Boston.

A unique feature of the exhibition was the large collection of

cut specimens of ornamental fruit bearing shrubs from the Arnold Arboretum, by Jackson Dawson, gardener. For the information of those who may desire to decorate their gardens with these rich ornaments, rendering it gay when the flowers are mainly passed away, we include the list furnished by Mr. Dawson.

LIST OF SHRUBS IN FRUIT EXHIBITED BY JACKSON DAWSON OF THE ARNOLD ARBORETUM.

Aralia hispida.
Alnus maritima.
" *viridis.*
Berberis Sinensis.
" " *variegata.*
" *Thunbergii.*
" *vulgaris.*
" " var. *hypoleuca.*
Celastrus scandens.
Cephalanthus occidentalis.
Colutea arborescens.
Cornus paniculata,
" *sericea.*
Cotoneaster acuminata.
Cratægus coccinea.
" *oxyacantha.*
" *tomentosa* var. *pyrifolia.*
Euonymus alatus.
" *Americana* var. *obovata.*
" *Europœus fructo purpurea.*
Ilex lœvigata.
" *verticillata* (red fruit).
" " (white fruit).
Lonicera flava.
" *hirsuta.*
" *Tartarica.*
Lycium Chinense.
Magnolia Umbrella.
Panax sessiliflora.
Phellodendron Amurensis.
Prunus Americana.
" *maritima.*
Prunus serotina.
" *Virginiana.*
Ptelea trifoliata.
Pyrus Americana.
" *baccata.*
" " var. *aurantiaca.*
" " " *cerasiformis.*
" " " *chlorocarpum.*
" " " *Sieboldii.*
" *Japonica Maulei.*
" " *nivalis.*
" " *umbilicata rosea.*
" *Malus flore pleno.*
" " *Toringo.*
" *prunifolia.*
" " var. *aurantiaca.*
" " " *macrocarpa.*
" " " *microcarpa.*
" *Ringo.*
" *spectabilis aurantiaca.*
Rhamnus frangula.
Rhus glabra.
" " *laciniata.*
Rosa Arkansana.
" *Californica.*
" *glauca.*
" *rugosa.*
Sambucus Canadensis.
" " var. *aurea.*
Symphoricarpus racemosus.
Taxus baccata var. *Canadensis.*
Viburnum opulus.
" *pubescens.*

CHRYSANTHEMUM SHOW.

November 9, 10 and 11.

The culmination of our exhibitions for the year occurred on the 9th, 10th, and 11th of November, when the Chrysanthemum Show was held, in our own Halls. The list of prizes was so munificent that it had stimulated all who knew how to grow these plants to their utmost endeavors to excel any former attempt; and when the exhibition was opened all the space in both halls was filled with a better grown class of plants than had ever before been shown by our Society. It is a pleasure to record the enthusiasm shown by growers of chrysanthemums, and it is also a pleasure to know that our Society, by its liberal offers in prizes, is bringing forward a larger number of competitors than ever before, and is thereby aiding to bring into prominence a class of plants the most floriferous of all, and blooming at a season of the year when no others do in any like profusion.

The practice of growing new kinds from seed is extending; and we are glad to record the fact that our President, Dr. Henry P. Walcott, Arthur H. Fewkes, George Seaverns, and others, showed some grand specimens of blooms from plants grown by them from seed planted this year.

It is also pleasant to record the fact that an entirely new group of flowers has reached us from Japan, having been sent to Mrs. Alpheus Hardy, by Neesima, a native of Japan, out of gratitude to Mrs. Hardy for favors shown him while in this country. These plants were exhibited by Edwin Fewkes & Son, and are well worthy to be grown by all loving these beautiful flowers.

One of this last mentioned collection has been named Mrs. Alpheus Hardy. It is a most beautiful, large, incurved Japanese variety, having feathery petals of wonderful delicacy and whiteness, and is the most sumptuous of the whole family thus far known. It was awarded the Society's Silver Medal for superior excellence.

The exhibition was well attended and was very much of a success.

The prizes for Herbaceous Plants have been closely competed for during the season by Nathaniel T. Kidder and J. W. Manning, Mr. Kidder gaining the Society's Silver Medal by only one point. Mr. Manning took the Bronze Medal as second prize.

Twelve cut blooms, of not less than six distinct varieties, excluding Gen. Jacqueminot, Norton Brothers,	$8 00
Second, Edwin Sheppard,	6 00
Third, Mrs. Francis B. Hayes,	4 00
Six cut blooms, distinct named varieties, Edwin Sheppard,	4 00
TENDER ROSES IN VASES.—Twelve blooms of Bon Silène, Norton Brothers,	3 00
Second, Samuel Neil,	2 00
Twelve blooms of Catherine Mermet, Norton Brothers,	5 00
Twelve blooms of Cornelia Cook, " "	5 00
Twelve blooms of Niphetos, Mrs. E. M. Gill,	5 00
Second, Norton Brothers,	4 00
Twelve blooms of Safrano, Samuel Neil,	3 00
Second, Mrs. Francis B. Hayes,	2 00
Twelve blooms of The Bride, Norton Brothers,	5 00
ORCHIDS.—Six plants in bloom, David Allan,	15 00
Second, Frederick L. Ames,	12 00
Third, E. W. Gilmore,	10 00
Fourth, David Allan,	8 00
Three plants in bloom, Samuel R. Payson,	8 00
Second, Frederick L. Ames,	6 00
Third, William J. Martin,	5 00
Fourth, E. W. Gilmore,	4 00
Single plant in bloom, Samuel R. Payson, *Cymbidium eburneum*,	5 00
Second, David Allan,	4 00
Third, Alfred W. Spencer,	3 00
STOVE OR GREENHOUSE PLANT.—Specimen in bloom, other than Azalea or Orchid, named, Samuel R. Payson,	6 00
Second, Mrs. Francis B. Hayes,	5 00
HARDY FLOWERING SHRUBS AND HERBACEOUS PLANTS, FORCED.—Six in pots, six distinct varieties, John L. Gardner,	8 00
CYCLAMENS.—Ten plants in bloom, Edwin Sheppard,	6 00
Three plants in bloom, Thomas Clark,	3 00
Second, Edwin Sheppard,	2 00
HARDY PRIMROSES, OR POLYANTHUSES, the second prize to William J. Martin,	3 00
CINERARIAS.—Six varieties, in bloom, in not over nine-inch pots, E. W. Gilmore,	8 00
Second, William J. Martin,	6 00
Third, Edwin Sheppard,	4 00
Single plant in bloom, William J. Martin,	3 00
Second, Charles M. Hovey,	2 00
VIOLETS.—Six pots, in bloom, William J. Martin, Marie Louise,	4 00
Second, William J. Martin, Swanley White,	3 00
Third, William J. Martin, Neapolitan,	2 00
PANSIES.—Six distinct varieties, in pots, in bloom, W. C. Ward,	4 00
Fifty cut blooms in the Society's flat fruit dishes, William J. Martin,	3 00

Second, W. C. Ward, ... $2 00
Third, Denys Zirngiebel, ... 1 00

CAMELLIAS.—Display of named varieties, cut flowers with foliage, not less than twelve blooms, of not less than six varieties, Charles M. Hovey, ... 5 00
Second, Mrs. Francis B. Hayes, ... 4 00

Six cut blooms, of not less than four varieties, with foliage, Mrs. Francis B. Hayes, ... 3 00
Second, Charles M. Hovey, ... 2 00

CENTRE PIECE for Dinner Table.—Best designed and best kept during the exhibition, Mrs. E. M. Gill, ... 10 00
Second, Mrs. A. D. Wood, ... 9 00
Third, Miss Sarah W. Story, ... 8 00

Special Prizes for Bulbs, offered by the General Union of Holland for the Promotion of the Cultivation of Bulbs.

HYACINTHS.—Fifty named bulbs in fifty pots, in bloom, not more than two of one sort:
William J. Martin, the First Prize, a Gold Medal.
Charles H. Hovey, the Second Prize, a Silver Gilt Medal.
Charles H. Hovey, the Third Prize, a Silver Medal.

TULIPS.—Twenty-five pots, single early varieties, in twenty-five distinct sorts, three bulbs of the same sort in a pot:
Charles H. Hovey, the Second Prize, a Silver Medal.
Charles M. Hovey, the Third Prize, a Bronze Medal.

POLYANTHUS NARCISSUS.—Twenty pots, three bulbs of the same sort in each pot, not more than two pots of one sort:
Charles H. Hovey, the First Prize, a Silver Gilt Medal.
Charles H. Hovey, the Second Prize, a Silver Medal.

Society's Prizes.

HYACINTHS.—Twelve distinct named varieties, in pots, one in each pot, in bloom, Charles H. Hovey, ... $10 00
Second, Charles M. Hovey, ... 8 00
Third, William J. Martin, ... 6 00

Six distinct named varieties, in pots, one in each pot, in bloom, Charles H. Hovey, ... 6 00
Second, Charles M. Hovey, ... 5 00
Third, William J. Martin, ... 4 00

Three distinct named varieties, in pots, one in each pot, in bloom, Charles H. Hovey, ... 4 00
Second, Charles M. Hovey, ... 3 00
Third, William J. Martin, ... 2 00

Single named bulb in pot, in bloom, Charles M. Hovey, Carlisle, 2 00
Second, Charles H. Hovey, La Neige, ... 1 00

Three pans, ten bulbs of one variety in each pan, William J. Martin,	$10 00
Second, Charles M. Hovey,	8 00
Third, Charles M. Hovey,	6 00
TULIPS.—Six six-inch pots, five bulbs in each, in bloom, William J. Martin,	5 00
Second, Charles M. Hovey,	4 00
Three six-inch pots, five bulbs in each, in bloom, Wm. J. Martin,	4 00
Second, Charles M. Hovey,	3 00
Three pans, ten bulbs of one variety in each pan, Wm. J. Martin,	5 00
POLYANTHUS NARCISSUS.—Four seven-inch pots, three bulbs in each, in bloom, Charles H. Hovey,	6 00
Second, Charles H. Hovey,	4 00
Third, Charles H. Hovey,	3 00
HARDY NARCISSUS AND DAFFODILS.—Best display, Charles M. Hovey,	8 00
Second, Charles H. Hovey,	6 00
GENERAL DISPLAY OF SPRING BULBS.—Charles M. Hovey,	20 00
Second, Charles H. Hovey,	15 00
LILY OF THE VALLEY.—Six six-inch pots, in bloom, Thomas Clark,	5 00
ANEMONES.—Three pans, Thomas Clark,	4 00

Gratuities:—

W. A. Manda,	Display of Herbaceous Plants,	25 00
David Allan,	" " Orchids and Cut Flowers,	15 00
Frederick L. Ames,	" " " " "	10 00
W. A. Manda,	" " Orchids, etc.,	10 00
E. W. Gilmore,	Display of Orchids,	3 00
Benjamin Grey,	Orchids and Cut Flowers,	2 00
Mrs. Francis B. Hayes,	Display of Plants and Flowers,	8 00
A. W. Blake,	" " Azaleas,	5 00
Charles M. Hovey,	Azalea Susette,	4 00
Mrs. F. B. Hayes,	Hybrid Perpetual Roses in pots,	3 00
Norton Brothers,	Cut Roses,	3 00
A. W. Spencer,	Calceolarias,	3 00
Thomas Clark,	Calceolarias,	2 00
Charles M. Hovey,	Amaryllis and Lilies,	3 00
Mrs. E. M. Gill,	Amaryllis,	2 00
Edwin Fewkes & Son,	Hybrid Primroses,	2 00
F. Palmer,	Seedling Carnation Primrose, cut blooms,	1 00
J. Walsh,	" " " "	1 00
Mrs. P. D. Richards,	Wild Plants,	1 00

APRIL 9.

Gratuity:—

Joseph H. Woodford, Forty Hyacinths,	3 00

APRIL 16.

Gratuities:—

Mrs. Francis B. Hayes, Azaleas, etc.,	$3 00
W. A. Manda, Orchids, Iris, Myosotis, etc.,	3 00

APRIL 30.

Gratuity:—

Mrs. Francis B. Hayes, six varieties of Himalayan Rhododendrons, and one hundred varieties of Azalea Indica,	5 00

MAY EXHIBITION.

MAY 7.

INDIAN AZALEAS.—Three plants in pots, named, William J. Martin,	$6 00
The third prize to Mrs. Francis B. Hayes,	4 00
Single specimen, William J. Martin,	4 00
Second, Charles M. Hovey,	3 00
CALCEOLARIAS.—Six varieties in pots, Thomas Clark,	6 00
Second, Thomas Clark,	5 00
Single plant, Thomas Clark,	2 00
Second, Thomas Clark,	1 00
GLOXINIAS.—Display of cut blooms, Thomas Clark,	8 00
Second, William J. Martin,	2 00
AURICULAS.—Ten, in pots, the third prize to Thomas Clark,	3 00
TULIPS.—Twenty-four blooms, distinct named varieties, Charles M. Hovey,	4 00
HARDY BULBS.—Best collection of blooms, Charles M. Hovey,	8 00
BASKET OF FLOWERS.—Mrs. E. M. Gill,	6 00
Second, Mrs. A. D. Wood,	5 00
Third, Miss Sarah W. Story,	4 00
PANSIES.—Fifty cut blooms in the Society's flat fruit dishes, W. C. Ward,	4 00
Second, Mrs. E. M. Gill,	3 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, William J. Martin,	2 00
Second, Miss Sarah W. Story,	1 00

Gratuities:—

Mrs. Francis B. Hayes, Cut Flowers,	4 00
E. Fewkes & Son, Narcissus,	1 00
J. H. Woodford, Hardy Bulbs,	1 00
Mrs. P. D. Richards, Native Plants,	2 00
Esther E. Barry, " "	2 00

MAY 14.

Gratuity:—

M. B. Faxon, Tulips and Narcissi,	2 00

MAY 21.

Gratuities:—

Mrs. Francis B. Hayes, two plants of Hydrangea Thomas Hogg, and Cut Flowers,	$5 00
J. W. Clark, Tulips,	1 00
Mrs. P. D. Richards, Wild Flowers,	2 00
E. H. Hitchings, " "	1 00

MAY 28.

Gratuities:—

E. H. Hitchings, Wild Flowers,	1 00
Frank C. Hyde, " " forty-five varieties,	1 00

RHODODENDRON SHOW.

JUNE 4.

Hunnewell Premiums.

RHODODENDRONS.—Eighteen hardy varieties, named, Mrs. Francis B. Hayes,	$10 00
HARDY AZALEAS.—Any and all classes; fifteen named varieties, one truss each, the second prize to T. C. Thurlow,	5 00
Six named varieties, one truss each, Charles M. Hovey,	4 00
Three " " " " Benjamin G. Smith,	2 00
Cluster of trusses, of one variety, Mrs. Francis B. Hayes,	2 00

Society's Prizes.

GERMAN IRIS.—Six distinct varieties, one spike of each, Edwin Fewkes & Son,	3 00
Second, Mrs. Francis B. Hayes,	2 00
CLEMATIS.—Named varieties, display of cut blooms, with foliage, Joseph H. Woodford,	4 00
NATIVE PLANTS.—Display of named species and varieties, Mrs. P. D. Richards,	4 00
Second, Walter E. Coburn,	3 00
CUT FLOWERS.—Display filling one hundred bottles, Mrs. A. D. Wood,	4 00
Second, Mrs. E. M. Gill,	3 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, William J. Martin,	2 00
Second, J. W. Manning,	1 00

Gratuities:—

H. H. Hunnewell, Rhododendrons and Azaleas,	10 00
W. A. Manda, Herbaceous Plants, and Hardy Trees and Shrubs,	5 00

Mrs. Francis B. Hayes, Rhododendrons and Azaleas, etc.,	$5 00
" " " Clematis,	2 00
John B. Moore & Son, Tree Pæonies and Roses,	8 00
Charles M. Hovey, Azaleas and Rhododendrons,	8 00
W. A. Manda, *Gladiolus Colvillii alba*,	1 00
Edwin Fewkes & Son, English Iris,	1 00
Miss E. M. Harris, Cut Flowers,	1 00

JUNE 11.

Gratuities:—

H. H. Hunnewell, Rhododendrons,	5 00
Jackson Dawson, Rare Flowering Shrubs,	5 00
Mrs. Francis B. Hayes, Rhododendrons,	5 00
" " " Azaleas,	3 00
" " " German Iris,	1 00
Edwin Fewkes & Son, " "	1 00
J. W. Manning, " "	1 00
" " Herbaceous Plants,	1 00
Anthony McLaren, " "	1 00
Edwin Sheppard, Cut Flowers,	1 00
Frank C. Hyde, Wild Flowers,	1 00

JUNE 18.

Gratuities:—

Mrs. Francis B. Hayes, Cut Blooms of Roses, Rhododendrons, and other Flowering Shrubs,	5 00
Edwin Fewkes & Son, Cut Roses,	2 00
William H. Spooner, " "	1 00
J. W. Manning, English Iris, eighteen varieties,	1 00
" " Herbaceous Plants,	1 00
" " Pæonies,	1 00
O. B. Hadwen, "	1 00
Mrs. E. M. Gill, Cut Flowers,	1 00

ROSE EXHIBITION.

JUNE 21 AND 22.

Special Prizes.

HYBRID PERPETUAL ROSES.—Twenty-four roses, of different varieties, named, John B. Moore & Son,	$25 00
Second, Warren Heustis & Son,	15 00
Twelve roses, of different varieties, named, William H. Spooner,	15 00
Eighteen roses, of different varieties, named, William H. Spooner,	20 00
Six roses, of any two varieties, three of each, John L. Gardner,	10 00

Twelve roses, of any four varieties, three of each, Mrs. Francis B. Hayes, ... $15 00
Eighteen roses, of any six varieties, three of each, J. B. Moore & Son, ... 20 00
Best and best kept Design, Table Decoration, or combination of Roses, in a basket or other receptacle, except a vase, Mrs. F. B. Hayes, ... 10 00
Second, Mrs. E. M. Gill, ... 8 00

Amateur's Prize.

Twenty-four named roses of different varieties, exhibited by an Amateur, Warren Heustis, ... 25 00
Second, John L. Gardner, ... 15 00

Six blooms of Alfred Colomb, John B. Moore & Son, . . . 4 00
" " Baroness Rothschild, John L. Gardner, . . . 4 00
" " John Hopper, John B. Moore & Son, . . . 4 00
Second, Mrs. Francis B. Hayes, . . . 3 00
" " Marquise de Castellane, Warren Heustis & Son, . 4 00
" " Merveille de Lyon, William H. Spooner, . . 4 00
" " Mme. Gabriel Luizet, Mrs. Francis B. Hayes, . 4 00
Second, John L. Gardner, ... 3 00
" " Mme. Victor Verdier, Warren Heustis & Son, . 4 00
Second, John B. Moore & Son, ... 3 00
Twelve blooms of any other variety, J. B. Moore & Son, . . 6 00
Second, Warren Heustis & Son, ... 4 00

Regular Prizes.

HARDY PERPETUAL ROSES.—Twenty-four distinct named varieties, three of each variety, John B. Moore & Son, . . . 20 00
Second, Warren Heustis & Son, ... 15 00
Twelve distinct named varieties, three of each, W. H. Spooner, 10 00
Six distinct named varieties, one of each, the second prize to John B. Moore & Son, ... 4 00
Third, Benjamin G. Smith, ... 3 00
Three distinct named varieties, one of each, Mrs. Francis B. Hayes, ... 4 00
Second, John L. Gardner, ... 3 00
Third, William F. Flanagan, ... 2 00
MOSS ROSES.—Six distinct named varieties, three clusters of each, John B. Moore & Son, ... 6 00
Second, Edwin Fewkes & Son, ... 4 00
Third, Charles M. Hovey, ... 3 00
Three distinct named varieties, three clusters of each, John B. Moore & Son, ... 4 00
Second, Edwin Sheppard, ... 3 00

HYBRID TEA ROSES.—Display in boxes, John B. Moore & Son,	$6 00
Second, Mrs. Francis B. Hayes,	4 00
GENERAL DISPLAY of one hundred bottles of Hardy Roses, John B. Moore & Son,	10 00
Second, Mrs. Francis B. Hayes,	9 00
Third, William H. Spooner,	8 00
Fourth, Edwin Fewkes & Son,	7 00
Fifth, Charles M. Hovey,	6 00
STOVE AND GREENHOUSE FLOWERING PLANTS —Five distinct named varieties in bloom, no Orchid admissible, David Allan,	15 00
Specimen Plant in bloom, named, other than Orchid, David Allan,	5 00
Second, Mrs. Francis B. Hayes,	4 00
HEATHS.—Six plants, of distinct named varieties, John L. Gardner,	6 00
Three plants, of distinct named varieties, David Allan,	4 00
Second, David Allan,	3 00
ORCHIDS.—Twelve plants, named varieties, in bloom, David Allan,	20 00
Second, E. W. Gilmore,	15 00
Six plants, named, Benjamin Grey,	10 00
Second, David Allan,	8 00
Third, Benjamin Grey,	6 00
Single specimen, Mrs. Oliver Ames, Sr.,	6 00
Second, Charles M. Hovey,	5 00
HERBACEOUS PÆONIES.—Ten named varieties, O. B. Hadwen,	6 00
Second, Charles M. Hovey,	5 00
SWEET WILLIAMS.—Thirty trusses, not less than six distinct varieties, L. W. Goodell,	3 00
Second, Edwin Sheppard,	2 00
Third, Charles M. Hovey,	1 00
HERBACEOUS PLANTS.—Largest and best arranged Collection, named, William J. Martin,	2 00
Second, J. W. Manning,	1 00

Gratuities:—

Thomas H. Meade, Collection of Hybrid Perpetual Roses,	6 00
" " " Collection of Tea Roses,	2 00
Warren Heustis & Son, La France Roses,	2 00
Benjamin G. Smith, Cut Roses,	2 00
M. B. Faxon, " "	2 00
John B. Moore & Son, " "	2 00
" " " Vases of Roses,	2 00
David Allan, Ferns, Dracænas, etc.,	10 00
" " Orchid Plants and Cut Blooms, etc.,	10 00
W. A. Manda, Orchids, etc..	10 00
E. W. Gilmore, Orchids, Crotons, etc.,	8 00
Jackson Dawson, Wild Roses from all countries, thirty-six species,	8 00
W. A. Manda, Cut Flowers,	6 00

Mrs. Francis B. Hayes, Cut Flowers,	$5 00
Edwin Sheppard, " "	5 00
Charles M. Hovey, Cut Fancy Pelargoniums, etc.,	5 00
H. H. Hunnewell, Foliage and Flowers,	5 00
W. A. Manda, Banana Plant,	3 00
Mrs. P. D. Richards, Native Plants,	3 00
Mrs. Francis B. Hayes, Hydrangea Thomas Hogg,	2 00
William J. Martin, Two Orchids,	2 00
Miellez Horticultural Co., Pansies,	2 00
Miss Ellen M. Harris, Pæonies,	1 00
B. D. Hill, "	1 00
O. B. Hadwen, Roses and Pæonies,	1 00

JUNE 28.

Gratuities:—

Mrs. Francis B. Hayes, Roses,	2 00
Marshall B. Faxon, "	2 00
William H. Spooner, "	2 00
Benjamin G. Smith, "	2 00
Warren Heustis & Son, "	2 00
Mrs. Francis B. Hayes, Orchid and Clematis,	2 00
B. D. Hill, Pæonies,	1 00

JULY 2.

DELPHINIUMS.—Six named varieties, Edwin Sheppard,	4 00
Second, Edwin Fewkes & Son,	3 00
Third, Anthony McLaren,	2 00
LILIUM CANDIDUM.—Twelve spikes, Benjamin G. Smith,	3 00
Second, William J. Martin,	2 00
CUT FLOWERS.—Display filling one hundred bottles, Mrs. A. D. Wood,	4 00
Second, Mrs. E. M. Gill,	3 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, William J. Martin,	2 00
Second, J. W. Manning.	1 00

Gratuities:—

Edwin Sheppard, Delphiniums,	1 00
Edwin Fewkes & Son, Salpiglossis and Delphiniums,	1 00
Benjamin G. Smith, Cut Flowers,	1 00
Miss Sarah W. Story, " "	1 00
Mrs. P. D. Richards, Native Plants,	1 00
Severance Burrage, " " ninety varieties,	1 00

JULY 9.

JAPAN IRIS (varieties of *Iris Kæmpferi*).—Best collection, John L. Gardner,	$8 00
Second, Edwin Fewkes & Son,	6 00
Third, J. F. C. Hyde,	5 00
Six named varieties, Edwin Fewkes & Son,	4 00
Second, J. F. C. Hyde,	3 00
VASE OF FLOWERS.—Best arranged, Mrs. E. M. Gill,	3 00
Second, Miss Sarah W. Story,	2 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, J. W. Manning,	2 00
Second, William J. Martin,	1 00

Gratuities:—

Edwin Sheppard, Japan Iris,	3 00
John L. Gardner, Five pots of Orchids,	5 00
Siebrecht & Wadley, New York, Cattleyas, five varieties,	2 00
M. B. Faxon, Hollyhocks,	1 00
Miss Sarah W. Story, Cut Flowers,	1 00
Severance Burrage, Native Plants,	1 00
F. C. Hyde, " "	1 00

JULY 16.

HOLLYHOCKS.—Single, six spikes, distinct colors, the second prize to Charles M. Hovey,	2 00
Double, twelve blooms, of twelve distinct colors, Edwin Sheppard,	4 00
Second, Edwin Fewkes & Son,	3 00
Six blooms, of six distinct colors, J. F. C. Hyde,	2 00
Second, Mrs. E. M. Gill,	1 00
CUT FLOWERS.—Display filling one hundred bottles, Mrs. E. M. Gill,	4 00
Second, Mrs. A. D. Wood,	3 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, J. W. Manning,	2 00

Gratuities:—

Jackson Dawson, Forty-four species and varieties of Flowering Shrubs,	5 00
Edwin Sheppard, Hollyhocks,	3 00
J. F. C. Hyde, "	3 00
Edwin Fewkes & Son, "	2 00
Paul D. Wallis, "	1 00
D. L. Taylor, " and Sweet Williams,	3 00
W. J. Underwood, Collection of Hardy Carnations,	2 00
Edwin Fewkes & Son, Salpiglossis and Japan Iris,	2 00

Mrs. Francis B. Hayes, Cut Flowers,	$3 00
Miss Sarah W. Story, " "	1 00
Severance Burrage, Wild Flowers,	2 00
Mrs. P. D. Richards, " "	2 00
E. H. Hitchings, " "	1 00
Walter E. Coburn, " "	1 00

JULY 23.

PERENNIAL PHLOXES.—Ten distinct named varieties, one spike each, Edwin Sheppard,	3 00
SWEET PEAS.—Display filling twenty-five vases, J. F. C. Hyde,	4 00
Second, Charles H. Hovey,	3 00
Third, C. W. Hoitt, Nashua, N. H.,	2 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, William J. Martin,	2 00
Second, J. W. Manning,	1 00

Gratuities:—

John L. Gardner, Six Orchids,	3 00
Benjamin Grey, Cut Orchid Flowers,	2 00
Mrs. Francis B. Hayes, Clerodendron and Cut Flowers,	2 00
J. F. C. Hyde, Hollyhocks,	1 00
Edwin Sheppard, "	1 00
Edwin Fewkes & Son, "	1 00
Mrs. E. M. Gill, Cut Flowers,	1 00
Miss Sarah W. Story, " "	1 00
Mrs. P. D. Richards, Wild Flowers,	1 00
Severance Burrage, " "	1 00
Walter E. Coburn, " "	1 00

JULY 30.

Special Prize, offered by M. B. Faxon.

SWEET PEAS.—Best display, filling fifty vases, judged by published scale of points, J. F. C. Hyde,	10 00

Regular Prizes.

CUT FLOWERS.—Display filling one hundred bottles, Mrs. E. M. Gill,	4 00
Second, Mrs. A. D. Wood,	3 00
NATIVE FERNS.—Best display, Mrs. P. D. Richards,	4 00
Second, Severance Burrage,	3 00
Third, Mrs. C. N. S. Horner,	2 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, J. W. Manning,	2 00
Second, William J. Martin,	1 00

Gratuities:—

Marshall B. Faxon, Sweet Peas,	$2 00
William J. Martin, Japan Pinks,	1 00
Edwin Fewkes & Son, Dahlias,	1 00
C. T. E. Clapp, Poppies, etc.,	1 00
J. W. Manning, Perennial Phlox,	1 00
Edwin Sheppard, Allamanda, etc.,	1 00
Mrs. P. D. Richards, Native Flowers,	1 00
Walter E. Coburn, " "	1 00
" " Native Ferns,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	1 00
A. A. Hixon, " "	1 00
Miss Sarah W. Story, " "	1 00
E. S. Hill, " "	1 00

AUGUST 6.

PERENNIAL PHLOXES.—Ten distinct named varieties, one spike each, Edwin Sheppard,	3 00
Second, Edwin Fewkes & Son,	2 00
PETUNIAS.—Collection filling thirty bottles, one spray in each, A. A. Hixon,	3 00
Second, Edwin Fewkes & Son,	2 00
Third, Mrs. E. M. Gill,	1 00
CUT FLOWERS.—Display filling one hundred bottles, Mrs. E. M. Gill,	4 00
Second, Mrs. A. D. Wood,	3 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, William J. Martin,	2 00
Second, J. W. Manning,	1 00
NATIVE FLOWERS.—Collection, Severance Burrage,	3 00
Second, Mrs. P. D. Richards,	2 00

Gratuities:—

William J. Martin, Achimenes,	4 00
James Cartwright, Gladioli,	3 00
John L. Gardner, Fuchsias,	2 00
" " *Brassavola Digbyana*,	1 00
Mrs. Francis B. Hayes, display of Cut Flowers,	3 00
J. W. Manning, *Lilium superbum*,	1 00
O. M. Holmes, *Nelumbium luteum*,	1 00
W. A. Manda, Cut Flowers,	1 00
A. A. Hixon, " "	1 00
John Parker, " "	1 00
E. S. Hill, " "	1 00
Walter E. Coburn, Native Flowers,	1 00

AUGUST 18.

GLADIOLI.—Twenty named varieties, in spikes, H. B. Watts,	$8 00
Second, James Cartwright,	6 00
Ten named varieties, in spikes, Edwin Sheppard,	4 00
Second, H. B. Watts,	3 00
Single spike, named, H. B. Watts,	1 00
Display of named and unnamed varieties, filling one hundred bottles, James Cartwright,	6 00
Second, H. B. Watts,	4 00
PHLOX DRUMMONDI.—Fifty bottles, not less than six varieties, the second prize to Charles M. Hovey,	2 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, J. W. Manning,	2 00
Second, William J. Martin,	1 00

Gratuities:—

J. Warren Clark, Seedling Gladioli,	5 00
Edwin Fewkes & Son, Dahlias and Zinnias,	2 00
Mrs. Francis B. Hayes, Zinnias, etc.,	1 00
" " " Cut Flowers,	3 00
John Parker, " "	1 00
Mrs. E. M. Gill, " "	1 00
E. S. Hill, " "	1 00
Mrs. A. D. Wood, Basket of Flowers,	1 00
Walter E. Coburn, Wild Flowers,	1 00

AUGUST 20.

ASTERS.—Truffaut's Pæony Flowered, thirty blooms, not less than twelve varieties, Marshall B. Faxon,	5 00
Second, James O'Brien,	4 00
Third, Edwin Sheppard,	3 00
Victoria Flowered, thirty blooms, not less than twelve varieties, William J. Martin,	5 00
Second, Edwin Sheppard,	4 00
Third, M. B. Faxon,	3 00
Pompon, thirty cut plants, not less than six varieties, the second prize to M. B. Faxon,	3 00
BASKET OF FLOWERS.—Best arranged, Mrs. A. D. Wood,	4 00
Second, Mrs. E. F. Hovey,	3 00
Third, James O'Brien,	2 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, J. W. Manning,	2 00
Second, William J. Martin,	1 00

Gratuities:—

Edwin Sheppard, Collection of Asters,	$1 00
Marshall B. Faxon, Asters,	1 00
James O'Brien, "	1 00
Herbert Gleason, *Lilium lancifolium*,	2 00
Edwin Fewkes & Son, Cannas,	1 00
" " " Dahlias,	1 00
George S. Tuttle, Pompon Dahlias,	1 00
H. B. Watts, Gladioli,	1 00
Mrs. Francis B. Hayes, Cut Flowers,	2 00
John Parker, " "	1 00
Mrs. E. M. Gill, " "	1 00
E. S. Hill, " "	1 00

AUGUST 27.

LILIUM LANCIFOLIUM.—Twelve spikes, William J. Martin,	4 00
Second, Thomas C. Thurlow,	3 00
Third, Mrs. E. M. Gill,	2 00
TROPÆOLUMS.—Display filling twenty-five vases, Mrs. E. M. Gill,	3 00
Second, Marshall B. Faxon,	2 00
MARIGOLDS.—Display filling twenty-five vases, L. W. Goodell,	3 00
Second, Marshall B. Faxon,	2 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, William J. Martin,	2 00
Second, J. W. Manning,	1 00

Gratuities:—

Marshall B. Faxon, Asters,	2 00
J. Warren Clark, Gladioli,	2 00
Edwin Fewkes & Son, Dahlias,	2 00
George S. Tuttle, Pompon Dahlias,	1 00
John Parker, Cut Flowers,	1 00
E. S. Hill, " "	1 00
Edwin Sheppard, " "	1 00
Walter E. Coburn, Native Plants and Flowers,	1 00
Mrs. P. D. Richards, Wild Flowers,	1 00

SEPTEMBER 3.

DOUBLE ZINNIAS.—Twenty-five flowers, not less than six varieties, Edwin Fewkes & Son,	3 00
Second, L. W. Goodell,	2 00
Third, A. B. Howard,	1 00
DIANTHUS.—Annual and Biennial varieties, Collection filling fifty bottles, single trusses, L. W. Goodell,	4 00
Second, Edwin Sheppard,	3 00

CUT FLOWERS.—Display filling one hundred bottles, Mrs. E. M. Gill, ... $4 00
Second, Mrs. A. D. Wood, ... 3 00
HERBACEOUS PLANTS.—Largest and best arranged collection, named, William J. Martin, ... 2 00
Second, J. W. Manning, ... 1 00

Gratuities:—

J. W. Clark, Gladioli, ... 3 00
J. F. C. Hyde, Hibiscus var., ... 1 00
A. B. Howard, Verbenas, ... 1 00
J. F. Marble, Pompon Dahlias, ... 1 00
George S. Tuttle, " " 1 00
Edwin Fewkes & Son, Dahlias and Zinnias, ... 1 00
Mrs. Francis B. Hayes, Cut Flowers, ... 2 00
John Parker, " " 1 00
Edwin Sheppard, " " 1 00
L. W. Goodell, " " 1 00
E. S. Hill, " " 1 00
*Miss E. E. Barry, Native Plants, ... 1 00
W. E. Coburn, Wild Flowers, ... 1 00
E. H. Hitchings, " " 1 00

ANNUAL EXHIBITION.

SEPTEMBER 13, 14, 15 AND 16.

Hunnewell Premiums.

EVERGREEN TREES AND SHRUBS.—Displays in pots, of other than native evergreens of New England, named, William C. Strong, ... $8 00
Second, F. L. Temple, ... 6 00

Society's Prizes.

GREENHOUSE PLANTS.—Twelve Greenhouse and Stove plants, of different named varieties, two Crotons admissible, H. H. Hunnewell, ... 60 00
Second, William J. Martin, ... 55 00
Third, George A. Nickerson, ... 50 00
Fourth, W. A. Manda, ... 40 00
Fifth, William J. Martin, ... 30 00
SPECIMEN FLOWERING PLANT.—John L. Gardner, ... 8 00
Second, Mrs. Francis B. Hayes, ... 7 00
Third, " " " 6 00
Fourth, John L. Gardner. 5 00
Fifth, William J. Martin, ... 4 00
Sixth, " " 3 00

VARIEGATED-LEAVED PLANTS.—Six named varieties, William J. Martin,	$12 00
Second, Thomas Clark,	10 00
Third, John L. Gardner,	8 00
Fourth, W. A. Manda,	6 00
Single specimen, named, etc., Charles H. Hovey,	6 00
Second, William J. Martin,	5 00
CALADIUMS.—Four named varieties, William J. Martin,	5 00
FERNS.—Ten named varieties, no Adiantums admissible, W. A. Manda,	15 00
Second, W. A. Manda,	12 00
ADIANTUMS.—Six named varieties, W. A. Manda,	8 00
Second, William J. Martin,	6 00
Third, W. A. Manda,	4 00
TREE FERN.—Thomas W. Dee,	10 00
Second, Mrs. Francis B. Hayes,	8 00
Third, W. A. Manda,	6 00
LYCOPODS.—Four named varieties, William J. Martin,	5 00
Second, W. A. Manda,	3 00
DRACÆNAS.—Six named varieties, H. H. Hunnewell,	8 00
Second, William J. Martin,	6 00
Third, Thomas Clark,	4 00
CROTONS.—Six named varieties, Thomas Clark,	8 00
Second, George A. Nickerson,	6 00
Third, William J. Martin,	5 00
PALMS OR CYCADS.—Single plant, named, H. H. Hunnewell,	10 00
Second, Mrs. Francis B. Hayes,	8 00
NEPENTHES.—Three plants, named, W. A. Manda,	6 00
SUCCULENTS.—Collection of all classes and varieties, including Agaves and Cacti, W. A. Manda,	15 00
Second, Charles H. Hovey,	10 00
ORCHIDS.—Six plants, named varieties, in bloom, Siebrecht & Wadley, New York,	12 00
Second, W. A. Manda,	10 00
Three plants, named varieties, in bloom, Benjamin Grey,	8 00
Second, John L. Gardner,	6 00
Third, Siebrecht & Wadley,	5 00
Single plant in bloom, Benjamin Grey,	5 00
Second, Siebrecht & Wadley,	4 00
Third, W. A. Manda,	3 00
Fourth, " "	2 00
DAHLIAS.—Twenty-four named varieties, M. B. Faxon,	8 00
Twelve named varieties, Edwin Fewkes & Son,	4 00
Second, Edwin Sheppard & Son,	3 00
Third, C. W. Hoitt, Nashua, N. H.,	2 00
Six named varieties, Edwin Sheppard,	3 00
Second, M. B. Faxon,	2 00

Third, John Parker,	$1 00
LILIPUTIAN DAHLIAS.—General display, with buds and foliage, filling twenty-five bottles, George S. Tuttle,	5 00
Second, F. Bacheller,	4 00
Third, John Parker,	3 00
SINGLE DAHLIAS.—General display, with buds and foliage, filling fifty bottles, W. A. Manda,	8 00
Second, Edwin Sheppard & Son,	6 00
Third, Mrs. E. M. Gill,	4 00
CUT FLOWERS.—Best display and best kept during the exhibition, filling one hundred and fifty bottles, Mrs. E. M. Gill,	16 00
Second, Mrs. A. D. Wood,	14 00
Third, Charles H. Hovey,	12 00

Special Prize, offered by M. B. Faxon.

PANSIES.—Fifty cut blooms in the Society's flat fruit dishes, judged by published scale of points, L. W. Goodell,	10 00

Gratuities:—

W. A. Manda, Decorative Plants,	$25 00
Mrs. Francis B. Hayes, " "	15 00
H. H. Hunnewell, " "	15 00
Charles H. Hovey, " "	10 00
John L. Gardner, " "	10 00
Jackson Dawson, Sixty-six varieties and species of Fruiting Shrubs,	10 00
William C. Strong, Ornamental Foliage,	3 00
Jacob W. Manning, Evergreen trees,	6 00
George A. Nickerson, Decorative Plants,	5 00
H. B. Watts, Display of Gladioli	5 00
L. W. Goodell, Asters,	5 00
Norton Brothers, Roses, etc.,	3 00
Thomas W. Dee, " "	2 00
" " " *Ficus elastica*,	2 00
Edwin Fewkes & Son, Cannas,	2 00
" " " " Dahlias,	2 00
R. T. Jackson, Marigolds,	2 00
" " Seedling Dahlias,	2 00
William C. Strong, Altheas,	2 00
M. B. Faxon, Dahlias and Nasturtiums,	2 00
F. L. Temple, Shrubs and Herbaceous Plants,	2 00
Mrs. F. B. Hayes, Cut Flowers,	5 00
E. S. Hill, " "	5 00
Edwin Sheppard & Son, " "	3 00
Mrs. E. F. Hovey, " "	2 00
Charles H. Hovey, " "	1 00
J. F. C. Hyde, Hibiscus and Gentian,	1 00

John Parker, Dahlias, ... $1 00
Jacob W. Manning, Herbaceous Plants, ... 2 00
Mrs. P. D. Richards, Native Flowers, ... 3 00
Miss Mary L. Vinal, " " 1 00
Mrs. E. M. Gill, Vase of Native Flowers, ... 1 00

CHRYSANTHEMUM SHOW.

NOVEMBER 9, 10, AND 11.

Special Prize.

CHRYSANTHEMUMS.—Display of twenty named plants for decorative purposes, in not over eight-inch pots, Edwin Fewkes & Son, $100 00
Second, W. H. Elliott, ... 75 00
Third, E. A. Wood, ... 50 00

Regular Prizes.

Six Incurved or Chinese, distinct named varieties, E. W. Wood, 20 00
Second, P. Melly, ... 15 00
Six Japanese, distinct named varieties, P. Melly, . . . 20 00
Second, E. Fewkes & Son, ... 15 00
Third, E. W. Wood, ... 10 00
Four Pompons, distinct named varieties, E. W. Wood, . . 10 00
Second, William J. Martin, ... 8 00
Specimen Plant, Incurved or Chinese, named, P. Melly, . . 8 00
Second, E. W. Wood, ... 6 00
Third, Edwin Fewkes & Son, ... 5 00
Specimen Plant, Japanese, named, E. W. Wood, . . . 8 00
Second, William J. Martin, ... 6 00
Third, Patrick Melia, ... 5 00
Specimen Plant, Pompon, named, E. W. Wood, ... 6 00
Second, Edwin Fewkes & Son, ... 5 00
Third, P. Melly, ... 4 00
Specimen Plant, Anemone, named, E. W. Wood, . . . 6 00
Second, Mrs. Francis B. Hayes, ... 5 00
Specimen trained Standard, any class, named, William J. Martin, Jardin des Plantes, ... 8 00
Second, William J. Martin, Grandiflora, ... 6 00
Third, William J. Martin, Fair Maid of Guernsey, . . . 5 00
Display of fifteen named plants in pots, all classes, distinct varieties, E. W. Wood, ... 50 00
Second, P. Melly, ... 40 00
Third, William J. Martin, ... 30 00
Fourth, Edwin Fewkes & Son, ... 25 00
Twelve Cut Blooms, Large Flowered or Chinese, named, in vases, Edwin Fewkes & Son, ... 8 00

Second, Mrs. J. M. Woodice,	$6 00
Twelve Cut Blooms, Japanese, named, in vases, Edwin Fewkes & Son,	8 00
Second, Mrs. J. M. Woodice,	6 00
Third, Charles H. Hovey,	5 00
Six Cut Blooms, reflexed, named, in vases, Edwin Fewkes & Son,	4 00
Second, E. A. Wood,	3 00
Six Cut Blooms, Large Flowered or Chinese, named, in vases, P. Melly,	4 00
Second, E. A. Wood,	3 00
Six Cut Blooms, Japanese, named, in vases, Edwin Fewkes & Son,	4 00
Second, Mrs. J. M. Woodice,	3 00
Third, E. A. Wood,	2 00
Display of all classes, filling fifty vases, Edwin Fewkes & Son.	12 00
Second, Mrs. Francis B. Hayes,	10 00
Third, P. Melly,	8 00
Fourth, Charles H. Hovey,	6 00
Display of all classes, filling twenty-five vases, Edwin Fewkes & Son,	6 00
Second, Mrs. E. M. Gill,	5 00
Bouquets.—Pair of Hand, Mrs. E. M. Gill,	5 00
Orchids.—Three Plants, named varieties, in bloom, E. W. Gilmore,	10 00
Second, E. W. Gilmore,	8 00
Third, E. W. Gilmore,	6 00
Single plant in bloom E. W. Gilmore, *Vanda cærulea*,	5 00
Second, E. W. Gilmore, Oncidium,	4 00

Gratuities:—

Edwin Fewkes & Son, Display of Plants,	15 00
H. P. Walcott, " " "	15 00
Mrs. Francis B. Hayes, " " "	15 00
William J. Martin, " " "	6 00
W. F. Melly, " " "	5 00
S. Neil, Display of Chrysanthemums,	10 00
Mrs. M. J. Plumstead, Seedling Chrysanthemums,	1 00
Norton Brothers, Roses,	5 00
E. W. Gilmore, Plants and Flowers,	8 00
Edwin Sheppard & Son, Display of Cut Flowers,	5 00
Mrs. Francis B. Hayes, " " " "	2 00
Mrs. P. D. Richards, Native Plants,	2 00

SILVER MEDALS.

February 5. Mrs. Francis B. Hayes, *Cœlogyne cristata.*

March 5. David Allan, *Cyclamen gigantea alba.*

Spring Exhibition, March 23–25. John Henderson, Flushing, N. Y., Rose Papa Gontier.

Spring Exhibition, March 23–25. Charles F. Evans, Philadelphia, Rose The Puritan.

" " " " W. A. Manda, Superior Grouping of Plants.

May 14. David Allan, *Dendrobium thyrsiflorum*.

Rose Exhibition, June 21–22. George McWilliams, gardener to J. Lassell, *Heliconia striata*.

August 6. William J. Martin, Superior culture of *Eucharis Amazonica*.

September 3. W. A. Manda, Hardy Herbaceous Plants, and Hardy Bulbs, with foliage; exhibited during the season.

" " Mrs. P. D. Richards, Educational displays of native plants in 1887.

Annual Exhibition, September 13–16. Siebrecht & Wadley, *Vanda Sanderiana*.

" " " " John Simpkins, *Victoria regia*.

October 29. H. H. Hunnewell, *Cypripedium Spicerianum*.

Chrysanthemum Show. November 9–11. Thomas Greaves, *Vanda Sanderiana*.

" " " " Edwin Fewkes & Son, New Chrysanthemum Mrs. Alpheus Hardy.

September 3. Nathaniel T. Kidder, Herbaceous Plants exhibited during the season.

" " W. A. Manda, Annual Flowers exhibited during the season.

BRONZE MEDALS.

September 3. Mrs. E. M. Gill, Hardy Herbaceous Plants and Hardy Bulbs with foliage; exhibited during the season.

" " Jacob W. Manning, Herbaceous Plants exhibited during the season.

" " Charles H. Hovey, Annual Flowers exhibited during the season.

FIRST CLASS CERTIFICATES OF MERIT.

January 22. Robert Blair, gardener to A. W. Spencer, *Lælia albida*.

Spring Exhibition, March 23–25. Charles M. Hovey, Ivy-leaved Pelargonium Fürst Josef von Hohenzollern.

" " " " Edwin Fewkes & Son, Cultivation of *Iris Susiana*.

" " " " F. Palmer, Superior culture of Rose William Francis Bennett.

April 2. John Henderson, Flushing, N. Y., Hybrid Perpetual Rose Her Majesty.

" " Mrs. E. M. Gill, Seedling Amaryllis Martha.

" 9. C. H. Eldering & Sons, Seedling Hyacinth Anna.

" 16. W. A. Manda, *Cypripedium acaule album*.

May 28. W. C. Strong, Seedling *Azalea mollis*.

Rhododendron Show, June 4. Kenneth Finlayson, Superior culture of Gloxinias.

" " " " W. A. Manda, *Erigeron aurantiacus* (new).

June 11. Mrs. Francis B. Hayes, Seedling Clematis, lavender.

" " " " " " " " lilac.

" " " " " " " Rhododendron.

Rose Exhibition, June 21. W. A. Manda, *Cattleya Eldorado Allaniana*.

June 28. James Comley, Seedling Magnolia, cross of *Grandiflora* and *Alexandrine*.

July 9. Siebrecht & Wadley, New York, *Cattleya gigas Rochelliana alba*.

August 13. George S. Tuttle, Superior Pompon Dahlias.

" 20. J. Warren Clark, Seedling Gladioli Pride of Millis, and Nugget of Gold.

September 3. William E. Endicott, Gladioli W. E. Endicott, and Canton.

Annual Exhibition, September 13–16. H. H. Hunnewell, *Phrynium variegatum*.

" " " " John L. Gardner, *Nepholepis rupescens*.

" " " " F. L. Temple, *Syringa ligustrina, Pekinensis pendula* (Weeping Lilac).

Exhibition of Autumn Fruits, October 1. James Comley, Seedling Tropæolum,

Chrysanthemum Show, Nov. 9–11. Mrs. J. M. Woodice, House Culture of Chrysanthemums.

" " " " William J. Martin, standard Chrysanthemum Plants.

" " " " H. P. Walcott, Display of Seedling Chrysanthemum blooms.

" " " " Arthur H. Fewkes, Seedling Chrysanthemums.

" " " " George Seaverns, Seedling Chrysanthemums.

November 19. George E. Buxton, Seedling Carnation White Gem.

REPORT

OF THE

COMMITTEE ON FRUITS,

FOR THE YEAR 1887.

By E. W. WOOD, CHAIRMAN.

The past year has been more than usually favorable for the growth of our various fruits; the frequent rains through the season having kept vegetation in a constantly growing condition. Fruit did not attain its full growth and maturity as early as in some previous years, and the earlier exhibitions did not compare favorably with those held in October and November.

We have again to report a continued increase in the Apple crop on the odd year. While formerly we were almost entirely dependent upon other states in alternate years for this fruit, the prizes have almost all been awarded the past season, and the supply has been fully equal to the demand for home consumption. This change has been effected in some instances by the destruction of the crop by canker worms for one or more years, and the trees coming again into bearing on the odd instead of the even year; in other cases the crop was destroyed for a single year by late frosts, causing a change in the bearing year. The crops of successive years have thus become more evenly balanced, to the advantage of both producer and consumer.

We have again had fair exhibits of Peaches. After four years of barrenness, covering almost the ordinary lifetime of the peach tree, many growers had failed to keep up their stock of trees and neglected those they had; yet the exhibits of this fruit were fair in quantity and quality. Those who grow the peach under present

conditions must not only exercise eternal vigilance, but equal persistence. However, the trees are easily and quickly grown, and an occasional crop will pay the expense of their cultivation.

The strawberry growers thought it was impossible to make a creditable exhibition on the day fixed for the Rose Show, and it was postponed to a later date. As this exhibition is one for which an admission fee is charged, it seems desirable to make it as attractive as possible to those interested in both fruit and flowers; and the experience of the past season as well as of some former years, goes to show the desirability of uniting the Rose and Strawberry shows in one exhibition. So much depends upon the condition of the weather at the time of this exhibition that it is extremely difficult for the Committee of Arrangements to fix the most desirable date, and still have time to give sufficient notice.

The amount of fruit shown at the last Strawberry Show was above the average of past years. The Belmont, Jewell, and Sharpless were the largest prize winners. The latter, having the advantage of time, has been the most widely disseminated; but the Belmont and Jewell have been very generally introduced the past season, and another year will determine their value for general cultivation. Within the past few years there has been a tendency among growers of this fruit to sacrifice quality to size. The three varieties alluded to, are all large and attractive, and command the highest prices in the market, but those who grow the fruit for their own table can hardly afford to accept them in exchange for La Constante, Wilder, Jucunda, and Hervey Davis.

The displays of other small fruits at the weekly exhibitions through the summer have been good; those of Cherries and Currants especially so. Blackberries and Raspberries are not so generally grown, as we have not a variety of either, of good size and quality, that has proved entirely hardy, and the wild fruits of these species form no exception.

The Annual Exhibition was held in connection with that of the American Pomological Society, and, in compliance with the wishes of its members, at an earlier date than was desirable for making the most creditable show of our own fruits. The quantity shown by members of our Society was above the average, but the specimens were not so large as in some former years. The quantity of fruit shown by members of the Pomological Society was unexpectedly small. The reason assigned was that the fruit crop in several of

the Western States the past season, was so nearly a failure that they could not make a creditable exhibition.

A very fine display of Apples was made from Arkansas; not as fine in grain and firm in flesh as our northern apples, but larger and fairer. The collection of seedlings from that state was especially noticeable; some of them were very fine specimens. The other exhibits of apples were by the Lincoln and Worcester Granges, and C. C. Shaw, of Milford, N. H.

Pears were shown by Ellwanger & Barry, of Rochester, N. Y., and by Charles H. Hovey, Warren Fenno, and Edward B. Wilder, members of this Society.

The prizes for Peaches were awarded to C. S. Smith, of Lincoln, Smith & Kerman, of St. Catherines, Ontario, and David L. Fisk, of Grafton.

An excellent display of one hundred and sixty-five varieties of Native Grapes was made by the T. S. Hubbard Company, of Fredonia, N. Y.; the first prize was awarded for this collection, and the second to E. Williams, of Montclair, N. J., these being the only collections offered.

There were no competitors for the prizes offered for Russian Apples, Plums, or Sub-tropical Fruits.

Of the one hundred and eighty-seven prizes offered by this Society, at the Annual Exhibition, for Pears and Apples, one hundred and eighty-two were awarded; of the eighteen prizes for Peaches in open culture, fifteen were taken; of the thirty-three prizes for Native Grapes, twenty-seven were taken, and of these eleven were taken by one exhibitor for fruit grown in New Jersey. The advantage to this exhibitor over the growers in this state in respect to the time of the exhibition, was shown by the fact that he took a prize for every variety except Moore's Early; that being the only one that had fully reached maturity here. It may be said that this exhibition was an exceptional one, and the same conditions are not likely to occur again; but it is not the first instance of fruit exhibited from other states having from the necessity of the case, a decided advantage in point of time, and suggests the inquiry whether our rules should not be so amended as to give members of the Society who are regular contributors at least equal advantages.

The attention of the Committee has not been called to as many new fruits as usual, the past season. The prize offered for a new

variety of Strawberry was awarded to a seedling shown by Warren Heustis & Son, and named the Bay State. It is above medium size, of good form, very dark color, and fair quality. The most noticeable single exhibit of fruit at the Annual Exhibition was an old variety shown by F. R. Shattuck, who placed upon the table some thirty specimens of Bartlett pears picked from the original imported Bartlett Tree, in Roxbury. Though not as large as some others that were shown of the same variety, yet in smoothness of surface and in form and color, they were superior to any others on exhibition.

At the November Exhibition Ex-President Hyde called the Committee's attention to a dish of apples which he had received from Worcester County, grown by a Mr. Barnes, who had given the fruit his own name, and sent a full account of the conditions under which it was grown, such as would seem to leave no doubt that it was a seedling variety. Soon after it was placed upon the table it was recognized by a member of the Society who had grown it for many, and known it for more than fifty, years as the Murphy. He sent some of his own fruit to be compared with that on exhibition, and there was no room for doubt as to their being identical. It is a medium sized red apple with peculiar black striped markings, which once seen would be readily recognized; and a small calyx in a very shallow corrugated basin. This is an instance of one of the ways by which synonyms become so largely multiplied.

The Hayes Grape, and the Belmont and Jewell Strawberries are the only fruits shown the past year as competing for Prospective Prizes.

Of the five hundred dollars appropriated for Special Prizes for fruit at the Pomological Society's Exhibition, there were awarded two hundred and fifteen dollars, leaving a balance of two hundred and eighty-five dollars. Of the seventeen hundred dollars appropriated for prizes and gratuities for the Society's Exhibitions, fifteen hundred and sixty-eight dollars were awarded, leaving a balance of one hundred and thirty-two dollars; unexpended balance of both appropriations, four hundred and seventeen dollars.

The results of the year show that there is a constantly increasing demand for fruit. The improvement in the different varieties makes it more desirable as a dessert for the table, the constantly increasing knowledge of its health-giving qualities as an article of food increases the demand for it for domestic uses, and the advan-

tages which this State has for disposing of any surplus, in addition to the considerations already named, tend to the conclusion that no branch of agriculture in Massachusetts offers a more inviting field than the cultivation of fruit.

E. W. Wood,
Samuel Hartwell,
Charles F. Curtis,
O. B. Hadwen,
Jacob W. Manning,
Benj. G. Smith,
Warren Fenno.

Fruit Committee.

PRIZES AND GRATUITIES AWARDED FOR FRUITS.

FEBRUARY 19.

Gratuity:—

Nahum Stetson, Oranges, Silver Medal.

SPRING EXHIBITION.

MARCH 23, 24, AND 25.

WINTER APPLES,—George C. Rice, Tompkins King,	$3 00
Second, Warren Fenno, Northern Spy,	2 00
WINTER PEARS.—Hittinger Brothers, Anjou,	3 00
Second, Warren Fenno, Josephine of Malines,	2 00
STRAWBERRIES.—One pint, Hittinger Brothers, Sharpless,	3 00

Gratuities:—

George C. Rice, Apples,	$2 00
Samuel Hartwell, "	1 00
H. Gleason, "	1 00
Warren Fenno, "	1 00
W. H. Badlam, "	1 00
O. B. Hadwen, Apples and Pears,	1 00
Mrs. H. V. Draper, Pears,	1 00
J. F. Smith, "	1 00
B. K. Bliss, Oranges,	1 00
Sewall Fisher, Melon Pear,	1 00

APRIL 22.

Gratuity:—

W. C. Winter, Peaches,	1 00

MAY 7.

Gratuity:—

James Comley, Strawberries,	3 00

JUNE 11.

Gratuities:—

L. W. Weston, Strawberries,	2 00
Charles S. Smith, "	2 00

JUNE 18.

Gratuities:—

William Doran & Son, Strawberries,	$1 00
S. S. Smith, "	1 00

ROSE EXHIBITION.

JUNE 21.

CHERRIES.—I. P. Langworthy, Knight's Early Black,	$2 00
FOREIGN GRAPES.—David Allan, Black Hamburg,	6 00
Second, E. S. Converse, Black Hamburg,	4 00

Gratuities:—

James H. Kimball, Strawberries,	3 00
George Hill, "	3 00
Warren Heustis & Son, "	2 00
George V. Fletcher, "	2 00
J. B. Moore & Son, "	1 00
William J. Martin, Collection of Strawberries,	1 00
I. E. Coburn, " " "	1 00
George F. Wheeler, " " "	1 00
L. W. Weston, " " "	1 00
W. A. Manda, Banana in fruit,	3 00

STRAWBERRY EXHIBITION.

JUNE 28.

Special Prizes.

STRAWBERRIES.—Four quarts of any variety, Warren Heustis & Son, Belmont,	$20 00
Second, Warren Heustis & Son, Jewell,	15 00
Third, Joseph D. Fitts, Providence, R. I., Jersey Queen,	10 00
For the best two quarts of any variety judged by points, James H. Kimball, Providence, R. I., Belmont,	12 00
Second, Warren Heustis & Son, Belmont,	9 00
Third, Warren Heustis & Son, Jewell,	6 00
Fourth, E. W. Wood, Hervey Davis,	3 00
For the best exhibition of a Seedling Strawberry introduced within five years, Warren Heustis & Son, Bay State, Silver Medal.	

Regular Prizes.

For the largest and best collection not less than ten baskets, two quarts each, Warren Heustis & Son,	20 00
Two quarts Belmont, Warren Heustis & Son,	4 00

Bidwell, Isaac E. Coburn,	$4 00
The Third Prize to William G. Prescott,	2 00
Charles Downing, C. N. Brackett,	4 00
Second, Warren Fenno,	3 00
Third, J. D. Fitts,	2 00
Cumberland, E. W. Wood,	4 00
Hervey Davis, Mrs. Francis B. Hayes,	4 00
Second, John B. Moore & Son,	3 00
Jewell, Isaac E. Coburn,	4 00
Miner's Prolific, O. R. Robbins,	4 00
Second, E. W. Wood,	3 00
Third, L. W. Weston,	2 00
Sharpless, Charles D. Tuttle,	4 00
Second, C. M. Hovey,	3 00
Third, William G. Prescott,	2 00
One quart Belmont, Warren Heustis & Son.	3 00
Second, Isaac E. Coburn,	2 00
Bidwell, Isaac E. Coburn,	3 00
Brighton, Warren Fenno,	3 00
Charles Downing, Isaac E. Coburn,	3 00
Second, Warren Fenno,	2 00
Crescent, Isaac E. Coburn,	3 00
Second, L. W. Weston	2 00
Cumberland, E. W. Wood,	3 00
Hervey Davis, Mrs. Francis B. Hayes,	3 00
Second, E. W. Wood,	2 00
Jersey Queen, J. D. Fitts,	3 00
Jewell, Isaac E. Coburn,	3 00
Second, O. R. Robbins,	2 00
Jucunda, Charles F. Curtis,	3 00
Manchester, the Second Prize to J. D. Fitts,	2 00
Miner's Prolific, Isaac E. Coburn,	3 00
Second, L. W. Weston,	2 00
Pioneer, E. W. Wood,	3 00
Sharpless, Edward B. Wilder,	3 00
Second, L. W. Weston,	2 00
Any other variety, Edward B. Wilder,	3 00
Second, Isaac E. Coburn,	2 00
Third, E. W. Wood,	1 00
Collection not less than six varieties, one quart each, George T. Wheeler,	8 00
Second, J. D. Fitts,	6 00
CHERRIES.—Two quarts of any variety, Edwin Hastings, Black Tartarian,	2 00
Second, S. Lockwood, Coe's Transparent,	1 00
Gratuity:—	
Samuel Hartwell, Cherries,	1 00

JULY 2.

STRAWBERRIES.—One quart of any variety, Warren Heustis & Son, Belmont,	$3 00
Second, O. R. Robbins, Miner's Prolific,	2 00
Third, L. W. Weston, Sharpless,	1 00
CHERRIES.—Two quarts of Black Tartarian, S. Lockwood,	2 00
Coe's Transparent, S. Lockwood,	2 00
Downer's Late, S. Lockwood,	2 00
Second, Warren Fenno,	1 00
Any other variety, A. S. McIntosh, Reine Hortense,	2 00
Second, Charles N. Brackett, Merriam,	1 00

JULY 9.

CHERRIES.—Two quarts of any variety, Warren Fenno, Norfolk,	2 00
Second, Charles S. Smith, Seedling,	1 00
RASPBERRIES.—Two quarts of any variety, William Doran & Son, Red Antwerp,	3 00
CURRANTS.—Two quarts of any Red variety, William Doran & Son, Versaillaise,	4 00
Second, B. G. Smith, Versaillaise,	3 00
Third, C. D. Tuttle, "	2 00
Two quarts of any White variety, B. G. Smith, Transparent,	3 00
Second, B. G. Smith, White Gondouin,	2 00

Gratuities:—

Charles N. Brackett, Cherries,	1 00
M. W. Chadbourne, Currants,	1 00

JULY 16.

RASPBERRIES.—Not less than four varieties, two quarts of each, William Doran & Son,	4 00
Two quarts of any variety, William Doran & Son, Franconia,	3 00
Second, B. G. Smith, Franconia,	2 00
CURRANTS.—One quart of Versaillaise, William Doran & Son,	2 00
Second, Mrs. E. M. Gill,	1 00
Any other Red variety, Sidney Lawrence, Fay's,	2 00
Second, B. G. Smith, Fay's,	1 00
Any White variety, B. G. Smith, Transparent,	2 00
Second, Mrs. E. M. Gill, Dana's Transparent,	1 00

Gratuity:—

Warren Fenno, Cherries,	1 00

JULY 23.

RASPBERRIES.—Two quarts of any variety, Charles Garfield, Seedling,	3 00
Second, Charles F. Curtis, Cuthbert,	2 00

Third, Mrs. Francis B. Hayes, Cuthbert,	$1 00
Currants.—One quart of any Red variety, William Doran & Son,	3 00
Second, B. G. Smith,	2 00
Third, Mrs. E. M. Gill,	1 00
One quart of any White variety, B. G. Smith, Dana's Transparent,	2 00
Second, B. G. Smith, Transparent,	1 00
Gooseberries.—Two quarts of any Native variety, B. G. Smith, Smith's Improved,	3 00
Second, Warren Fenno, Downing,	2 00
Third, B. G. Smith, Downing,	1 00
Gratuities:—	
Charles Garfield, Gooseberries,	1 00
Edwin A. Hall, "	1 00
Warren Fenno, "	1 00
Winter Brothers, Foreign Grapes,	5 00

July 30.

Blackberries.—Two quarts of any variety, A. S. McIntosh, Dorchester,	3 00
Second, W. C. Eustis, Dorchester,	2 00
Third, B. G. Smith, "	1 00
Gooseberries.—Two quarts of any Foreign variety, B. G. Smith, Bang-Up,	2 00
Second, B. G. Smith, Whitesmith,	1 00
Pears.—Summer Doyenne, Warren Fenno,	3 00
Second, Horace Eaton,	2 00
Third, C. D. Tuttle,	1 00
Any other variety, A. S. McIntosh, Madeleine,	3 00
Second, Warren Fenno, Madeleine,	2 00
Third, C. M. Hovey, Suprême de Quimper,	1 00
Peaches.—Any variety, Samuel Hartwell, Waterloo,	3 00
Second, Charles S. Smith, Amsden,	2 00
Gratuities:—	
Mrs. E. M. Gill, Gooseberries,	1 00
Warren Fenno, "	1 00
Charles Garfield, Raspberries and Gooseberries,	1 00
B. G. Smith, Blackberries and Blueberries,	1 00
L. W. Weston, Blackberries and Peaches,	1 00
Samuel Hartwell, Apples and Gooseberries,	1 00

August 6.

Apples.—Sweet Bough, Warren Heustis & Son,	3 00
Second, Warren Fenno,	2 00
Third, Joseph G. Coolidge,	1 00

Any other variety, W. S. Frost, Williams,	$3 00
Second, Theodore Wellington, Astrachan,	2 00
Third, Samuel Hartwell, Williams,	1 00
PEARS.—Giffard, B. G. Smith,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Warren Fenno,	1 00
Any other variety, C. N. Brackett, Bloodgood,	3 00
Second, C. M. Hovey, Brandywine,	2 00
Third, C. N. Brackett, Jargonelle,	1 00
BLACKBERRIES.—Two quarts of any variety, William J. Martin, Dorchester,	3 00
Second, A. S. McIntosh, Dorchester,	2 00
Third, G. D. Tuttle, Wachusett,	1 00
PEACHES.—Any variety, Mrs. E. Ward, Amsden,	3 00
Second, William S. Janvrin, Early July,	2 00

Gratuities:—

Warren Fenno, Apricots,	1 00
Samuel Hartwell, Apples and Peaches,	1 00
B. G. Smith, Plums and Gooseberries,	1 00

AUGUST 13.

APPLES.—Oldenburg, the Second Prize to Samuel Hartwell,	2 00
Red Astrachan, C. C. Shaw,	3 00
Second, Samuel Hartwell,	2 00
Third, J. T. Foster,	1 00
Williams's Favorite, C. F. Curtis,	3 00
Second, Samuel Hartwell,	2 00
Third, C. N. Brackett,	1 00
PEARS.—Clapp's Favorite, E. W. Wood,	3 00
Second, C. F. Curtis,	2 00
Third, C. N. Brackett,	1 00
Manning's Elizabeth, Mrs. Mary Langmaid,	2 00
Second Warren Fenno,	1 00
Any other variety, George Frost, Suprême de Quimper,	2 00
Second, N. D. Harrington, Bloodgood,	1 00
PEACHES.—Any variety, A. M. Davenport, Rivers,	3 00
Second, Samuel Hartwell, Crawford's Early,	2 00

Gratuities:—

Samuel Hartwell, Apples and Peaches,	1 00
Warren Fenno, Apricots,	1 00

AUGUST 20.

PEARS.—Bartlett, C. N. Brackett,	3 00
Second, Samuel Hartwell,	2 00
Third, E. W. Wood,	1 00

Rostiezer, Michael Finegan,	$3 00
Second, C. N. Brackett,	2 00
Third, M. W. Chadbourne,	1 00
Tyson, A. S. McIntosh,	3 00
Second, Warren Fenno,	2 00
Third, C. N. Brackett,	1 00
Any other variety, A. S. McIntosh, Clapp's Favorite,	3 00
Second, Edwin A. Hall, " "	2 00
Third, C. N. Brackett, " "	1 00
PEACHES.—Any variety, C. S. Smith, Mountain Rose,	3 00
Second, George V. Fletcher, Hale's Early,	2 00
Third, Warren Fenno, " "	1 00

Gratuities:—

G. D. Tuttle, Apples and Pears,	1 00
Samuel Hartwell, Apples and Plums,	1 00

AUGUST 27.

APPLES.—Chenango, Charles F. Curtis,	3 00
Second, Samuel Hartwell,	2 00
Maiden's Blush, Warren Fenno,	3 00
Second, Horace Eaton,	2 00
Third, Charles S. Smith,	1 00
Any other variety, Warren Fenno, Summer Pippin,	3 00
Second, Charles F. Curtis, Williams's Favorite,	2 00
Third, C. N. Brackett, Sparhawk,	1 00
PEARS.—Bartlett, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Third, George Frost,	1 00
Any other variety, William H. Hunt, Clapp's Favorite,	3 00
Second, M. W. Chadbourne, " "	2 00
Third, L. M. Chase, " "	1 00
PEACHES.—Any variety, Charles S. Smith, Mountain Rose,	3 00
Second, Mrs. Mary T. Goddard, Crawford's Early,	2 00
Third, Samuel Hartwell, " "	1 00
PLUMS.—Mrs. H. V. Draper, Washington,	3 00
Second, Samuel Hartwell, "	2 00
Third, B. G. Smith, Green Gage,	1 00
NATIVE GRAPES.—Six bunches of any variety, Cephas H. Brackett,	3 00
Second, B. G. Smith, Champion,	2 00
Third, Samuel Hartwell, Moore's Early,	1 00

Gratuity :—

Samuel Hartwell, Apples,	1 00

SEPTEMBER 3.

APPLES.—Foundling, Charles S. Smith,	3 00
Second, L. W. Weston,	2 00

Third, Samuel Hartwell,	$1 00
Gravenstein, Samuel Hartwell,	3 00
Second, Charles S. Smith,	2 00
Third, Mrs. Mary T. Goddard,	1 00
Porter, L. W. Weston,	3 00
Second, P. G. Hanson,	2 00
Third, W. H. Teel,	1 00
Any other variety, Warren Fenno, Summer Pippin,	3 00
Second, Samuel Hartwell, " "	2 00
Third, C. W. Park, Maiden's Blush,	1 00
PEARS.—Andrews, Samuel Saunders,	3 00
Second, Warren Fenno,	2 00
Third, B. Scullings,	1 00
Boussock, C. N. Brackett,	3 00
Second, O. B. Hadwen,	2 00
Third, Mrs. Mary Langmaid,	1 00
Any other variety, Samuel Hartwell, Souvenir du Congrès,	3 00
Second, C. N. Brackett, " " "	2 00
Third, Samuel Hartwell, Bartlett,	1 00
PEACHES.—Collection, Charles S. Smith,	4 00
Second, Samuel Hartwell,	3 00
Third, N. D. Harrington,	2 00
PLUMS.—Collection, Samuel Hartwell,	3 00
Any one variety, Robert Manning, Jefferson,	2 00
Second, Samuel Hartwell, Yellow Gage,	1 00
NATIVE GRAPES.—Six bunches of Cottage, B. G. Smith,	3 00
Moore's Early, Samuel Hartwell,	3 00
Second, O. R. Robbins,	2 00
Any other variety, B. G. Smith, Lady,	3 00
Second, Cephas H. Brackett, Hartford,	2 00

Gratuities:—

Theodore Wellington, Apples,	1 00
L. M. Chase, Plums,	1 00

ANNUAL EXHIBITION.

SEPTEMBER 13, 14, 15, AND 16.

Special Prizes for Apples, from the Benjamin V. French Fund.

Baldwin, C. C. Shaw,	$5 00
Gravenstein, Samuel Hartwell,	5 00
Hubbardston, Mrs. A. Ward,	5 00
Rhode Island Greening, Mrs. A. Ward,	5 00

Special Prizes offered by the Society.

PEARS.—Anjou, Samuel Hartwell,	5 00

Bartlett, Samuel Hartwell,	$5 00
Bosc, Mrs. Mary Langmaid,	5 00
Seckel, M. W. Chadbourne,	5 00
Sheldon, L. W. Weston,	5 00
PEACHES.—Any variety, Samuel Hartwell, Foster,	5 00
FOREIGN GRAPES.—For the heaviest and best ripened bunch of any Foreign Black Grape, not less than five pounds, David Allan, Alicante,	8 00
For the heaviest and best ripened bunch of any Foreign White Grape, not less than five pounds, John Simpkins, Syrian,	8 00

Special Prizes offered in view of the meeting of the American Pomological Society.

GENERAL DISPLAY OF FRUITS OF ALL KINDS.—For the best, Lincoln Grange,	25 00
APPLES.—For the best collection, Arkansas Exhibit,	25 00
Second, Worcester Grange,	15 00
Third, C. C. Shaw, Milford, N. H.,	10 00
PEARS.—For the best collection, Ellwanger & Barry, Rochester, N. Y.,	25 00
Second, Charles H. Hovey,	15 00
Third, Warren Fenno,	10 00
PEACHES.—For the best collection, Charles S. Smith,	25 00
Second, Smith & Kerman, St. Catherines, Ontario,	15 00
Third, David L. Fisk,	10 00
NATIVE GRAPES.—For the best collection, T. S. Hubbard Company, Fredonia, N. Y.,	25 00
Second, E. Williams, Montclair, N. J.,	15 00

Regular Prizes.

APPLES.—Baldwin, L. W. Weston,	4 00
Second, Mrs. A. Ward,	3 00
Third, W. H. Teele,	2 00
Danvers Sweet, C. C. Shaw,	3 00
Second, J. T. Foster,	2 00
Dutch Codlin, A. S. McIntosh,	2 00
Second, L. W. Weston,	1 00
Fall Orange or Holden, H. D. Clark,	3 00
Second, C. E. Grant,	2 00
Third, Samuel Hartwell,	1 00
Fameuse, S. H. Coombs,	3 00
Second, George V. Fletcher,	2 00
Third, Mrs. A. Ward,	1 00
Foundling, Reuben Handley,	4 00
Second, L. W. Weston,	3 00
Third, Charles S. Smith,	2 00

Golden Russet, Warren Fenno,	$2 00
Second, Horace Eaton,	1 00
Gravenstein, Samuel Hartwell,	4 00
Second, Mrs. Mary T. Goddard,	3 00
Third, Warren Fenno,	2 00
Hubbardston, M. W. Chadbourne,	4 00
Second, Samuel Hartwell,	3 00
Third, C. C. Shaw,	2 00
Hunt Russet, W. H. Teel,	3 00
Second, Samuel Hartwell,	2 00
Third, Horace Eaton,	1 00
Lady's Sweet, Horace Eaton.	2 00
Second, Warren Fenno,	1 00
Leicester, O. B. Hadwen,	2 00
Lyscom, Samuel Hartwell,	2 00
Second, T. B. Cowan,	1 00
Maiden's Blush, C. C. Shaw,	2 00
Second, Warren Fenno,	1 00
Mother, Warren Fenno,	3 00
Second, W. H. Teel,	2 00
Northern Spy, C. C. Shaw,	3 00
Second, Warren Fenno,	2 00
Third, F. W. Grout,	1 00
Porter, George W. Stevens,	3 00
Second, Samuel Hartwell,	2 00
Third, L. W. Weston,	1 00
Pumpkin Sweet, Samuel Hartwell,	2 00
Second, L. W. Weston,	1 00
Rhode Island Greening, Mrs. A. Ward,	4 00
Second, W. H. Teel,	3 00
Third, George V. Fletcher,	2 00
Roxbury Russet, Mrs. Mary T. Goddard,	4 00
Second, G. Sanderson,	3 00
Third, James Cutler,	2 00
Tolman Sweet, Josiah Crosby,	3 00
Second, J. T. Foster,	2 00
Third, Charles F. Curtis,	1 00
Tompkins King, George C. Rice,	3 00
Second, C. C. Shaw,	2 00
Third, Samuel Hartwell,	1 00
Washington Royal or Palmer, Josiah Crosby,	3 00
Second, O. B. Hadwen,	2 00
Washington Strawberry, George C. Rice,	2 00
Second, Warren Fenno,	1 00
Any other variety, John E. Bowen, Bowen,	3 00
Second, Warren Fenno, Summer Pippin,	2 00
Third, Samuel Hartwell, " "	1 00

CRAB APPLES.—Hyslop, Mrs. A. Ward,	$2 00
Second, Cephas H. Brackett,	1 00
Transcendent, George W. Stevens,	2 00
Second, A. Dickinson,	1 00
PEARS.—Angouleme, John McClure,	4 00
Second, Edwin A. Hall,	3 00
Third, Warren Fenno,	2 00
Anjou, Mrs. Mary Langmaid,	4 00
Second, J. Albro,	3 00
Third, Cephas H. Brackett,	2 00
Fourth, John McClure,	1 00
Bartlett, Leverett M. Chase,	4 00
Second, T. M. Davis,	3 00
Third, Samuel Hartwell,	2 00
Fourth, John McClure,	1 00
Belle Lucrative, A. Dickinson,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Warren Fenno,	1 00
Bosc, John L. Bird,	4 00
Second, Charles F. Curtis,	3 00
Third, William P. Walker,	2 00
Fourth, Warren Fenno,	1 00
Boussock, C. N. Brackett,	3 00
Second, L. M. Chase,	2 00
Third, O. B. Hadwen,	1 00
Clairgeau, Mrs. Mary Langmaid,	3 00
Second, W. P. Plimpton,	2 00
Third, Warren Fenno,	1 00
Comice, Warren Fenno,	3 00
Second, W. P. Walker,	2 00
Third, C. N. Brackett,	1 00
Dana's Hovey, Mrs. Mary Langmaid,	4 00
Second, Edward J. Young,	3 00
Third, Charles H. Hovey,	2 00
Diel, Edwin A. Hall,	3 00
Second, A. S. McIntosh,	2 00
Third, Jesse Haley,	1 00
Goodale, O. B. Hadwen,	3 00
Hardy, Charles F. Curtis,	3 00
Second, Samuel Hartwell,	2 00
Third, A. S. McIntosh,	1 00
Howell, E. W. Wood,	3 00
Second, Warren Fenno,	2 00
Third, George Hill,	1 00
Lawrence, T. A. Dawson,	3 00
Second, Samuel Hartwell,	2 00
Third, C. N. Brackett,	1 00

Louise Bonne of Jersey, George Hill,	$3 00
Second, Benjamin G. Smith,	2 00
Third, Varnum Frost,	1 00
Marie Louise, Warren Fenno,	3 00
Second, A. S. McIntosh,	2 00
Third, Edwin A. Hall,	1 00
Merriam, Charles F. Curtis,	3 00
Second, Warren Heustis & Son,	2 00
Third, Warren Fenno,	1 00
Onondaga, O. B. Hadwen,	3 00
Second, C. H. Hovey,	2 00
Third, W. P. Walker,	1 00
Paradise of Autumn, L. M. Chase,	3 00
Second, Charles N. Brackett,	2 00
Third, Warren Fenno,	1 00
Seckel, T. M. Davis,	4 00
Second, W. C. Eustis,	3 00
Third, John L. Bird,	2 00
Sheldon, Charles F. Curtis,	4 00
Second, Cephas H. Brackett,	3 00
Third, Charles N. Brackett,	2 00
Souvenir du Congrès, Charles N. Brackett,	3 00
Second, Samuel Hartwell,	2 00
Third, J. T. Foster,	1 00
St. Michael Archangel, Warren Heustis & Son,	3 00
Second, W. C. Eustis,	2 00
Third, Jacob Eaton,	1 00
Superfin, Warren Heustis & Son,	3 00
Second, Warren Fenno,	2 00
Third, Michael Finegan,	1 00
Urbaniste, A. S. McIntosh,	3 00
Second, Warren Fenno,	2 00
Third, Jacob Eaton,	1 00
Vicar, Samuel Hartwell,	3 00
Second, Edwin A. Hall,	2 00
Third, Michael Finegan,	1 00
Winter Nelis, Edwin A. Hall,	3 00
Second, Jesse Haley,	2 00
Third, Warren Heustis & Son,	1 00
Any other variety, Edward B. Wilder, Lemuel Clapp,	3 00
Second, O. B. Hadwen, Frederick Clapp,	2 00
Third, Charles E. Brooks, Earle's Bergamot,	1 00
PEACHES.—Coolidge's Favorite, Charles S. Smith,	3 00
Crawford's Early, David L. Fiske,	3 00
Second, E. H. Luke,	2 00
Third, Mrs. Mary T. Goddard,	1 00
Foster, David L. Fiske,	3 00

Second, Samuel Hartwell,	$2 00
Third, Charles S. Smith,	1 00
Oldmixon, Charles S. Smith,	3 00
Second, N. D. Pierce, Jr.,	2 00
Stump the World, David L. Fiske,	3 00
Second, Charles S. Smith,	2 00
Third, N. D. Pierce, Jr.,	1 00
Any other variety, Samuel Hartwell, Crawford's Late,	3 00
Second, N. D. Harrington, " "	2 00
Third, David L. Fiske, Mountain Rose,	1 00
NECTARINES.—Warren Fenno,	2 00
PLUMS.—Not less than four varieties, Samuel Hartwell,	5 00
Second, Horace Eaton,	4 00
Third, B. G. Smith,	3 00
Any one variety, Mrs. Mary T. Goddard, Victoria,	3 00
Second, Samuel Hartwell, Imperial,	2 00
Third, Mrs. Mary T. Goddard, Blue Imperial,	1 00
NATIVE GRAPES.—Six bunches of Brighton, George V. Fletcher,	3 00
Second, C. C. Corby, New Jersey,	2 00
Concord, C. C. Corby,	3 00
Second, William Doran & Son,	2 00
Third, Cephas H. Brackett,	1 00
Cottage, C. C. Corby,	3 00
Second, B. G. Smith,	2 00
Delaware, Cephas H. Brackett,	3 00
Second, C. C. Corby,	2 00
Third, Samuel Hartwell,	1 00
Eumelan, C. C. Corby,	3 00
Second, B. G. Smith,	2 00
Massasoit, Cephas H. Brackett,	3 00
Second, C. C. Corby,	2 00
Moore's Early, Samuel Hartwell,	3 00
Second, George V. Fletcher,	2 00
Third, O. R. Robbins,	1 00
Niagara, C. C. Corby,	3 00
Second, O. R. Robbins,	2 00
Wilder, Cephas H. Brackett,	3 00
Second, C. C. Corby,	2 00
Worden, C. C. Corby,	3 00
Second, O. R. Robbins,	2 00
Third, Samuel Hartwell,	1 00
Any other variety, B. G. Smith, Lady,	3 00
Second, C. C. Corby, Herbert,	2 00
Third, C. C. Corby, Pocklington,	1 00
FOREIGN GRAPES.—Four varieties, two bunches each, David Allan,	10 00
The third prize to E. H. Luke,	6 00
Two bunches of Black Hamburg, David Allan,	5 00

Second, John Simpkins,	$4 00
Third, William J. Martin,	3 00
Wilmot's Hamburg, David Allan,	5 00
The Third Prize to E. H. Luke,	3 00
Muscat of Alexandria, David Allan,	5 00
Any other variety, David Allan, Alicante,	5 00
Second, John Simpkins, Syrian,	4 00
Third, E. H. Luke, White Frontignan,	3 00
CRANBERRIES.—Half-peck, Dwight C. Robbins,	3 00

Gratuities:—

Horace Eaton, Apples and Quinces,	2 00
C. N. Brackett, Apples and Pears,	2 00
F. R. Shattuck, Bartlett Pears from the original Bartlett Tree,	3 00
John B. Moore & Son, display of Eaton and Hayes Grapes,	Silver Medal

EXHIBITION OF AUTUMN FRUITS.

OCTOBER 1.

APPLES.—Gravenstein, Samuel Hartwell,	3 00
Second, William T. Hall,	2 00
Third, Levi Leach,	1 00
Holden, C. E. Grant,	3 00
Second, Samuel Hartwell,	2 00
Mother, O. B. Hadwen,	3 00
Second, Warren Fenno,	2 00
Porter, Samuel Hartwell,	3 00
Second, Charles S. Smith,	2 00
Any other variety, William Winn, Tompkins King,	3 00
Second, S. H. Coombs, Fameuse,	2 00
PEARS.—Angouleme, John McClure,	3 00
Second, Varnum Frost,	2 00
Third, Samuel G. Damon,	1 00
Bosc, John L. Bird,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, William S. Janvrin,	1 00
Clairgeau, William T. Hall,	3 00
Second, Mrs. Mary Langmaid,	2 00
Third, Warren Fenno,	1 00
Comice, Warren Fenno,	3 00
Second, Charles N. Brackett,	2 00
Third, William P. Walker,	1 00
Frederick Clapp, Horace Eaton,	3 00
Louise Bonne of Jersey, T. M. Davis,	3 00
Second, W. P. Walker,	2 00
Third, Benjamin G. Smith,	1 00

Seckel, S. G. Damon,	$3 00
Second, Leverett M. Chase,	2 00
Third, T. M. Davis,	1 00
Sheldon, Charles E. Wiggin,	3 00
Second, Charles F. Curtis,	2 00
Third, Cephas H. Brackett,	1 00
Superfin, S. G. Damon,	3 00
Second, A. S. McIntosh,	2 00
Third, George L. Lovett,	1 00
Urbaniste, L. M. Chase,	3 00
Second, B. G Smith,	2 00
Third, S. G. Damon,	1 00
Any other variety, W. P. Walker, Hardy,	3 00
Second, Warren Fenno, Howell,	2 00
Third, George L. Lovett, Paradise of Autumn,	1 00
QUINCES.—Any variety, W. S. Janvrin,	2 00
Second, B. G. Smith,	1 00
PEACHES.—Any variety, Samuel Hartwell, Crawford's Late,	3 00
Second, Charles S. Smith, Stump the World,	2 00
Third, C. H. Johnson, Seedling,	1 00
NATIVE GRAPES.—Six bunches of Brighton, B. G. Smith,	3 00
Second, Joseph S. Chase,	2 00
Third, Samuel Hartwell,	1 00
Concord, Andrew J. Bigelow,	3 00
Second, William H. Hunt,	2 00
Third, Charles Garfield,	1 00
Delaware, Horace Eaton,	3 00
Second, B. G. Smith,	2 00
Third, S. G. Damon,	1 00
Iona, S. G. Damon,	3 00
Second, B. G. Smith,	2 00
Third, Horace Eaton,	1 00
Isabella, S. G. Damon,	3 00
Second, B. G. Smith,	2 00
Lindley, B. G. Smith,	3 00
Second, Albert M. Davenport,	2 00
Third, J. S. Chase,	1 00
Massasoit, J. S. Chase,	3 00
Second, Cephas H. Brackett,	2 00
Moore's Early, Samuel Hartwell,	3 00
Second, Charles Garfield,	2 00
Pocklington, George W. Jameson,	3 00
Second, Samuel Hartwell,	2 00
Third, J. S. Chase,	1 00
Prentiss, B. G. Smith,	3 00
Second, Samuel Hartwell,	2 00
Third, Joseph S. Chase,	1 00

Wilder, E. A. Adams,	$3 00
Second, Cephas H. Brackett,	2 00
Third, S. G. Damon,	1 00
Any other variety, Samuel Hartwell, Worden,	3 00
Second, J. H. Chase, Vergennes,	2 00
Third, Samuel Hartwell, Hayes,	1 00
Foreign Grapes.—Two bunches of any variety, William J. Martin, Black Hamburg,	4 00
Third, B. G. Smith, Black Hamburg,	2 00

CHRYSANTHEMUM SHOW.

November 9, 10, and 11.

Special Prizes for Apples, from the Benjamin V. French Fund.

Baldwin, W. S. Frost,	$5 00
Hubbardston, W. S. Frost,	5 00

Regular Prizes.

Apples.—Baldwin, O. B. Wyman,	3 00
Second, R. E. Warren,	2 00
Third, J. T. Foster,	1 00
Danvers Sweet, J. T. Foster,	3 00
Second, C. C. Shaw,	2 00
Hubbardston, C. C. Shaw,	3 00
Second, M. W. Chadbourne,	2 00
Third, W. S. Frost,	1 00
Hunt Russet, Starkes Whiton,	3 00
Second, Samuel Hartwell,	2 00
Third, W. H. Teel,	1 00
Lady's Sweet, O. B. Wyman,	3 00
Second, Warren Fenno,	2 00
Third, Mrs. W. S. Horner,	1 00
Northern Spy, C. C. Shaw,	3 00
Second, William T. Hall,	2 00
Third, Mrs. E. T. Burbank,	1 00
Rhode Island Greening, W. H. Teel,	3 00
Second, Charles N. Brackett,	2 00
Third, C. E. Grant,	1 00
Roxbury Russet, Cephas H. Brackett,	3 00
Second, Mrs. Mary T. Goddard,	2 00
Third, Mrs. W. S. Horner,	1 00
Tolman's Sweet, John Keough,	3 00
Second, T. Putnam Symonds,	2 00
Third, William Eames,	1 00
Tompkins King, William Winn,	3 00
Second, John Parker,	2 00
Third, George C. Rice,	1 00
Any other variety, George C. Rice, Peck's Pleasant,	3 00
Second, Samuel Hartwell. Gloria Mundi,	2 00

Third, William Eames, Newark Pippin,	$1 00
PEARS.—Angouleme, Mrs. A. H. Lewis,	4 00
Second, John McClure,	3 00
Third, Samuel G. Damon,	2 00
Fourth, Jesse Haley,	1 00
Anjou, William T. Hall,	4 00
Second, Mrs. Mary Langmaid,	3 00
Third, A. S. McIntosh,	2 00
Fourth, C. N. Brackett,	1 00
Clairgeau, William T. Hall,	3 00
Second, Warren Fenno,	2 00
Third, S G. Damon,	1 00
Comice, Warren Fenno,	4 00
Second, Charles H. Hovey,	3 00
Third, Mrs. Mary Langmaid,	2 00
Fourth, Jesse M. Haley,	1 00
Dana's Hovey, Edward Richards,	4 00
Second, Mrs. Mary Langmaid,	3 00
Third, O. R. Robbins,	2 00
Fourth, Willard P. Plimpton,	1 00
Diel, Edwin A. Hall,	3 00
Second, William P. Walker,	2 00
Third, T. M. Davis,	1 00
Glout Morceau, Warren Fenno,	3 00
Second, Mrs. Mary Gardner,	2 00
Third, Edwin A. Hall,	1 00
Josephine of Malines, Warren Fenno,	3 00
Second, Benjamin G. Smith,	2 00
Third, John L. Bird,	1 00
Langelier, A. S. McIntosh,	3 00
Second, A. H. Lewis,	2 00
Third, E. J. Hewins,	1 00
Lawrence, William T. Hall,	3 00
Second, Andrew McDermott,	2 00
Third, Warren Fenno,	1 00
Vicar, Edwin A. Hall,	3 00
Second, William T. Hall,	2 00
Third, A. S. McIntosh,	1 00
Winter Nelis, Edwin A. Hall,	3 00
Second, A. McDermott,	2 00
Third, A. A. Johnson,	1 00
Any other variety, S. G. Damon, Marie Louise,	3 00
Second, C. B. Hagar, Bosc,	2 00
Third, Warren Fenno, Duchess of Bordeaux,	1 00
Gratuities:—	
M. W. Chadbourne, Pears,	1 00
Edwin A. Hall, Winter Nelis Pears,	1 00
O. M. Holmes, Cranberries,	2 00

REPORT

OF THE

COMMITTEE ON VEGETABLES,

FOR THE YEAR 1887.

By CHARLES N. BRACKETT, Chairman.

A review of the exhibitions made in this department from week to week during the season, brings prominently to view the interest manifested in the cultivation of the products of the earth, and the improvement in their character which is constantly being made. From the opening exhibition in January, to the closing one in November, we have seen samples of the choicest products of the vegetable garden, bountifully displayed on our tables. These displays have added to the interest of the exhibitions, have been much admired by visitors at our rooms, and would compare favorably with the best results of former years, both as regards quality and variety.

The past season has been fairly favorable for nearly all varieties of vegetables, if we except the potato. The early prospect for this crop was fine, and up to the month of August it never looked more promising. About this time, favored by the hot, wet weather of midsummer, the rot suddenly made its appearance in its worst form, causing immense losses in the aggregate, throughout a wide section of the country. It has not been an uncommon thing to hear from certain sections, of the entire destruction of the crop by this disease. Wherever the potato is grown the potato fungus is liable to make its appearance. There is no known remedy for the disease, and no special system of culture can be relied on to

prevent it. Heavy dews, rains, fogs, and excessive heat followed by excessive moisture, favor its development, while during seasons of protracted drought little is to be feared from its attacks. Many fungi, it is said, have a limited period of growth, or develop only at certain seasons of the year. If this is so, early planting may secure a crop against the ravages of a late growing fungus, while the attacks of an early fungus may be avoided by pursuing an opposite course. This theory was well illustrated the past season in the grounds of the writer. Where early planting was resorted to the crop was entirely free from disease, maturing before the atmospheric conditions favorable to the growth or development of the germs were present. From the experience of the past, early planting of such varieties as mature early is to be recommended, and promises the best results.

It is perhaps difficult to decide, with our present knowledge, whether deterioration and loss of vigor, occurring to a variety in course of cultivation, are owing to constitutional tendency, or are the result of faulty methods of cultivation. Certain it is, however, that many varieties of the potato, formerly famous and profitable, have disappeared from cultivation and have been supplanted by new-comers. Every year witnesses the introduction of many new varieties, most of which are no better, if as good, as already existing standard sorts. The old Jackson White, Carter, and the once unexcelled Chenango or Mercer, had to give way to such varieties as the Early Goodrich, Davis Seedling, and Gleason, which in their turn have disappeared to make room for the Early Rose, Hebron, Clark, and others, and if we are allowed to judge from the experience of the past, these favorites of the present day will before long have to yield their places to newer varieties fresh from the seed.

Each year brings out many new kinds of Peas, some of them old varieties under new names, while others are actual new sorts of great value, and it would be injudicious not to give them a fair trial, as we may reasonably expect that really meritorious varieties will arise, and should be substituted for inferior sorts. It may be considered a very poor year if our English friends on the other side of the water do not succeed in sending us at least a half dozen new varieties for trial. Among these new comers Laxton's Evolution, shown here for the first time by the Chairman, may be mentioned as one of the handsomest and best. It originated with

Thomas Laxton, of England, and is a cross between the celebrated Champion of England, and the large Blue Imperial. The vines grow from three to three and a half feet high, are immensely strong and stocky, and have a branching habit, bearing continuously pods of the largest size, each containing from eight to twelve large wrinkled peas which are unusually rich, tender, and fine flavored. The pods are from five to six inches in length, of a beautiful deep green color, and hang in clusters of two and three on the vine. Owing to their branching habit less seed is required to plant a row than of the common sorts, and a single sowing will continue to bear for ten or twelve weeks. In planting, the distance apart of the peas in a row should be not less than four inches. As a new variety this certainly promises to be particularly valuable for the kitchen garden, on account of the length of time it continues in bearing, as well as for its size and excellent quality. At the weekly exhibitions the leading varieties have been American Wonder, Stratagem, and Advancer, and these varieties have taken the prizes.

The weekly shows have been well attended, and the displays of the various vegetable productions during the entire season were especially noteworthy, both as regards their quantity and quality. Competition for the prizes has been more spirited than usual, and quite a number of new contributors have entered the lists during the year. Nearly all the prizes have been awarded.

Among the novelties introduced the past season we note as worthy of particular mention, Dreer's Early Golden Cluster Wax Pole bean, which, on account of its many good qualities, we feel assured has come to stay. It is distinct in habit of growth and in seed from the Giant Red Wax, and in earliness surpasses all other pole beans. The pods, which are of a rich golden yellow, retain their tender qualities long after the beans have acquired a large size, so that only a few days elapse, after they cease to be fit for string beans, before they may be used to shell. The pods are from six to eight inches long, of large size, and are borne profusely in large clusters of from three to six; each pod containing from six to eight medium sized beans somewhat resembling the Lima and equally good in quality as a shell bean. As a string bean it snaps easily, is stringless, cooks tender and is of delicate flavor. The beans, the past season, although not planted until the first of June, were large enough for use by the middle of July,

and continued in bearing until killed by frost. Should this new bean sustain the character with other cultivators which it has exhibited in the grounds of the Chairman, it will prove to be one of the most valuable of the many contributions which Mr. Dreer has made to horticulture, and may worthily bear his name.

The display made in this department at the Annual Exhibition was very full and complete, except as regards potatoes, which as before remarked, were generally a failure with most contributors on account of the rot. In these, therefore, there was not much competition, and the prizes were all taken by the few contributors who were so fortunate as to have good specimens in sufficient number to exhibit. Mrs. M. T. Goddard made the best display and carried off most of the prizes.

The exhibition of Squashes at the Annual Show was the best which has been made for several years. The new Hybrid Turbans are attaining a deserved place in the front rank, and hereafter will be recognized, as they should be, in our Schedule of Prizes. Some very fine specimens were shown by W. W. Rawson and others at this exhibition.

Cauliflowers have been more abundant than usual and the quality has been excellent. The specimens shown at the Annual and and November Exhibitions were highly creditable to the contributors. W. W. Rawson and A. M. Teel were respectively awarded the Special Prizes at the Annual Exhibition.

The first Tomatoes of out-door growth were shown July 9, by George Hill. As in previous seasons, there has been a large number of competitors for the prizes, and this vegetable has formed an interesting and attractive feature of our exhibitions. I. E. Coburn's exhibits both during the season and at the Annual Show, are entitled to special mention. A few so-called new varieties were shown, but there did not appear to be distinction enough between them and many well known sorts now in cultivation to require any special note at this time.

Decidedly the best specimens of Salsify ever shown before the Society, were placed on exhibition by Charles F. Curtis at our Annual Exhibition. For quite a number of years Mr. Curtis has taken the lead in the cultivation of this vegetable, but the exhibit which he made at that time excelled all former efforts in this direction.

The special prizes for Celery were awarded to W. W. Rawson

and C. A. Learned. In accordance with the requirements of the Schedule, persons competing for these prizes must renew their stands each day of the exhibition, and the prizes are to be awarded for the best specimens best kept during the four days, the award being made on the morning of the last day. In making their examination the Committee found that on the first two days C. A. Learned's stand was best, but on the following two days W. W. Rawson was first; and after diligent search, failing to discover a single point wherein one stand excelled the other, the Committee came to the conclusion that in this dilemma the fairest way to decide the matter was to make an equal division of the first and second prizes between the competitors, which was accordingly done.

Prizes and gratuities have been awarded during the year to sixty-five different contributors, and out of the appropriation made for this department an unexpended balance of twenty-four dollars remains to be returned to the treasury.

Annexed is a list of the awards in prizes and gratuities which have been made by your Committee during the year.

All of which is respectfully submitted.

CHARLES N. BRACKETT,
WARREN HEUSTIS,
CEPHAS H. BRACKETT,
GEORGE HILL,
P. G. HANSON,
VARNUM FROST,
JACOB HITTINGER.

Vegetable Committee.

PRIZES AND GRATUITIES AWARDED FOR VEGETABLES.

January 1.

Radishes.—Four bunches of any variety, Hittinger Brothers,	$3 00
Second, George F. Stone,	2 00
Lettuce.—Four heads of Tennisball, Hittinger Brothers,	3 00
Second, George F. Stone,	2 00
Parsley.—Two quarts, George F. Stone,	3 00
Second, Hittinger Brothers,	2 00
Third, Warren Heustis & Son,	1 00
Mushrooms.—Twenty-four, Cephas H. Brackett,	3 00
Tomatoes.—Twelve, C. H. Brackett, for Optimus,	3 00
Second, " " " Emery,	2 00
Third, W. C. Winter, for Essex,	1 00
Gratuities:—	
Warren Heustis & Son, Celery,	1 00
George F. Stone, Dandelions,	1 00

January 8.

Gratuities:—	
C. H. Brackett, Asparagus,	1 00
W. W. Rawson, Radishes,	1 00

February 5.

Radishes.—Four bunches of any variety, George F. Stone,	3 00
Second, W. D. Philbrick,	2 00
Cucumbers.—Pair of any variety, Frederick C. Fisher,	3 00
Dandelions.—Peck, Frederick C. Fisher,	3 00
Second, George F. Stone,	2 00
Third, Warren Heustis & Son,	1 00
Lettuce.—Four heads of Tennisball, George F. Stone,	3 00
Mushrooms.—Twenty-four, C. H. Brackett,	3 00
Rhubarb.—Twelve stalks, Mrs. Francis B. Hayes,	3 00
Second, George E. Sanderson,	2 00
Third, C. H. Brackett,	1 00
Tomatoes.—Twelve, Charles Winter,	3 00
Second, W. C. Winter,	2 00
Third, C. H. Brackett,	1 00

Gratuities:—

Warren Heustis & Son, Celery, ... $1 00
George F. Stone, Parsley, ... 1 00

FEBRUARY 12.

Gratuities:—

Mrs. Francis B. Hayes, Celery and Rhubarb, ... 2 00
Edwin Sheppard, Cucumbers, ... 1 00

MARCH 5.

Gratuity:—

Hittinger Brothers, Collection, ... 2 00

MARCH 12.

Gratuities:—

C. H. Brackett, Mushrooms and Asparagus, ... 2 00
George F. Stone, Lettuce, ... 1 00

SPRING EXHIBITION.

MARCH 23, 24, AND 25.

RADISHES.—Four bunches of Turnip Rooted, George E. Sanderson, $3 00
Second, W. W. Rawson, ... 2 00
Third, W. Heustis & Son, ... 1 00
Four bunches of Long Scarlet, W. Heustis & Son, . . . 3 00
ASPARAGUS.—Two bunches, twelve stalks in each, C. H. Brackett, 3 00
CUCUMBERS.—Pair of White Spine, Frederick C. Fisher, . . 3 00
Second, G. M. Kendall, ... 2 00
Third, James Heslan, ... 1 00
CELERY.—Four roots, John Coolidge, ... 3 00
Second, Warren Heustis & Son, ... 2 00
DANDELIONS.—Peck, George F. Stone, ... 3 00
Second, Frederick C. Fisher, ... 2 00
LETTUCE.—Four heads of Tennisball, C. H. Brackett, . . . 3 00
Second, W. W. Rawson, ... 2 00
Third, Hittinger Brothers, ... 1 00
WATER-CRESS.—Two quarts, Mrs. Francis B. Hayes, . . . 2 00
PARSLEY.—Two quarts, Hittinger Brothers, ... 2 00
Second, George F. Stone, ... 1 00
RHUBARB.—Twelve stalks, C. W. Winn, ... 3 00
Second, C. H. Brackett, ... 2 00
Third, George E. Sanderson, ... 1 00
TOMATOES.—Twelve, Charles Winter, ... 3 00

Gratuities:—

Edwin Sheppard, Cucumbers, ... 1 00

C. H. Brackett, Mushrooms,	$1 00
S. R. Payson, "	1 00
C. M. Hovey, "	1 00
William J. Martin, Lettuce,	1 00

APRIL 9.

ASPARAGUS.—Two bunches, twelve stalks in each, C. H. Brackett,	3 00
CUCUMBERS.—Pair of White Spine, C. H. Brackett,	3 00
Second, Frederick C. Fisher,	2 00
MUSHROOMS.—Twenty-four, C. H. Hovey,	3 00
Second, C. H. Brackett,	2 00

Gratuities:—

G. F. Stone, Lettuce,	1 00
C. A. Learned, "	1 00

APRIL 16.

Gratuities:—

Mrs. Francis B. Hayes, Tomatoes,	1 00
Varnum Frost, Cucumbers,	1 00

APRIL 23.

Gratuities:—

Mrs. Francis B. Hayes, Collection,	2 00
James Heslan, Cucumbers,	1 00

MAY 7.

ASPARAGUS.—Four bunches, twelve stalks each, John B. Moore & Son,	3 00
CUCUMBERS.—Pair, C. H. Brackett, Brighton,	3 00
Second, C. H. Brackett, New Variety,	2 00
Third, George Hill, White Spine,	1 00
SPINACH.—Peck, George Hill, Round Leaf,	3 00
Second, Warren Heustis & Son, Oak Leaf,	2 00
Third, " " " Round Leaf,	1 00
DANDELIONS.—Peck, Warren Heustis & Son,	2 00
Second, George Hill,	1 00
LETTUCE.—Four heads, George Hill,	3 00
Second, George F. Stone,	2 00
RHUBARB.—Twelve stalks, C. H. Brackett,	3 00
Second, M. W. Chadbourne,	2 00
Third, George Dorr,	1 00

Gratuities:—

Mrs. Francis B. Hayes, Potatoes and Cress,	1 00
George Hill, Radishes,	1 00

MAY 14.

Gratuities:—

George Hill, Collection,	$2 00
Josiah Crosby, Egyptian Beets,	1 00
Samuel Hartwell, Asparagus,	1 00

MAY 21.

Gratuities:—

Charles D. Tuttle, Asparagus,	1 00
Josiah Crosby, Radishes,	1 00

MAY 28.

Gratuity:—

C. H. Brackett, Mushrooms and Cucumbers,	1 00

RHODODENDRON SHOW.

JUNE 4.

BEETS.—Twelve of any variety, C. H. Brackett,	$3 00
ASPARAGUS.—Four bunches, twelve stalks in each, John B. Moore & Son,	3 00
Second, L. W. Weston,	2 00
Third, C. D. Tuttle,	1 00
CUCUMBERS.—Pair, Edwin Sheppard, Telegraph,	3 00
Second, Varnum Frost, White Spine,	2 00
Third, C. H. Brackett, " "	1 00
LETTUCE.—Four heads, Varnum Frost,	3 00
Second, George Hill,	2 00
Third, Warren Heustis & Son,	1 00
RHUBARB.—Twelve stalks, C. H. Brackett,	3 00
Second, John B. Moore & Son,	2 00
Third, Mrs. Francis B. Hayes,	1 00
MUSHROOMS.—Twenty-four, C. H. Brackett,	3 00

Gratuities:—

Mrs. Francis B. Hayes, Potatoes,	1 00
Samuel Hartwell, Asparagus,	1 00

JUNE 11.

Gratuity:—

Josiah Crosby, Beets and Onions,	1 00

JUNE 18.

Gratuities:—

Samuel Hartwell, Peas,	1 00
C. E. Grant, "	1 00

ROSE EXHIBITION.

JUNE 21 AND 22.

BEETS.—Twelve Summer Turnip Rooted, W. W. Rawson,	$3 00
Second, Warren Heustis & Son,	2 00
Third, W. W. Rawson,	1 00
Twelve Egyptian, W. W. Rawson,	3 00
Second, Josiah Crosby,	2 00
Third, C. A. Learned,	1 00
ONIONS.—Twelve, Josiah Crosby,	3 00
Second, C. A. Learned,	2 00
CUCUMBERS.—Pair of White Spine, C. H. Brackett,	3 00
Second, George F. Stone,	2 00
Third, W. W. Rawson,	1 00
CABBAGES.—Three, W. W. Rawson, Etampes,	3 00
Second, C. A. Learned, Henderson's,	2 00
Third, W. W. Rawson, Express,	1 00
LETTUCE.—Four heads of any variety, M. Earnest Moore,	3 00
Second, C. A. Learned,	2 00
Third, W. W. Rawson,	1 00
PEAS.—Half-peck of any variety, W. Heustis & Son, American Wonder,	3 00
Second, Samuel Hartwell, American Wonder,	2 00
Third, C. N. Brackett, " "	1 00

Gratuities:—

William J. Martin, Cucumbers,	1 00
Parker & Wood, Maud S. Peas,	1 00
C. A. Learned, Collection,	5 00
Josiah Crosby, "	1 00
C. H. Brackett, "	1 00

JUNE 28.

Gratuities:—

C. E. Grant, Peas,	4 00
Samuel Hartwell, Peas,	1 00
M. Earnest Moore, Lettuce and Cucumbers,	1 00
Warren Heustis & Son, Collection,	3 00
W. W. Rawson, "	3 00
C. A. Learned, "	2 00

JULY 2.

ONIONS.—Twelve, C. A. Learned,	2 00
Second, George Hill,	1 00
SQUASHES.—Four Long Warted, George Hill,	2 00

Second, Warren Heustis & Son,	$1 00
Four Scalloped, George Hill,	2 00
CABBAGES.—Three, George Hill,	3 00
Second, C. A. Learned, Henderson's,	2 00
Third, " " Wakefield,	1 00
PEAS.—Half-peck American Wonder, Warren Heustis & Son,	3 00
Second, C. N. Brackett,	2 00
Third, C. E. Grant,	1 00
Any other variety, C. N. Brackett, Stratagem,	3 00
Second, C. E. Grant, Advancer,	2 00
Third, C. N. Brackett, Telephone,	1 00

Gratuities:—

C. A. Learned, Collection,	3 00
E. A. Moore, Lettuce and Cucumbers,	1 00
C. H. Brackett, Wax Beans,	1 00

JULY 9.

POTATOES.—Twelve, C. N. Brackett, Clark,	3 00
Second, C. D. Tuttle, Hebron,	2 00
Third, C. H. Brackett, Clark,	1 00
BEANS.—Half-peck of String,	3 00
Second, Mrs. E. M. Gill,	2 00
PEAS.—Half-peck of any variety, I. E. Coburn, Stratagem,	3 00
Second, Samuel Hartwell, Stratagem,	2 00
Third, C. E. Grant, "	1 00

Gratuities:—

C. E. Grant, Sweet Corn,	1 00
C. N. Brackett, Peas and Potatoes,	1 00
G. N. Smith, Lee's Favorite Potatoes,	1 00
George Hill, Tomatoes,	1 00
C. H. Brackett, "	1 00

JULY 16.

BEANS.—Half-peck of Cranberry, C. N. Brackett,	$3 00
PEAS.—Half-peck of any variety, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Third, Warren Heustis & Son,	1 00
SWEET CORN.—Twelve ears, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Third, C. E. Grant,	1 00
TOMATOES.—Twelve, George Hill, Emery,	3 00
Second, C. N. Brackett, Acme,	2 00
Third, C. H. Brackett, Optimus,	1 00

Gratuities:—

C. N. Brackett, Potatoes and Beans,	$1 00
Warren Heustis & Son, Potatoes,	1 00
C. D. Tuttle, Collection,	2 00

JULY 23.

POTATOES.—Twelve, C. D. Tuttle,	3 00
Second, I. E. Coburn,	2 00
Third, C. N. Brackett,	1 00
SQUASHES.—Three Marrow, George Hill,	3 00
SWEET CORN.—Twelve ears, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Third, Josiah Crosby,	1 00
TOMATOES.—Twelve, Varnum Frost,	3 00
Second, C. N. Brackett,	2 00
Third, George Hill,	1 00

Gratuities:—

Josiah Crosby, Marrow Squashes,	2 00
Mrs. Francis B. Hayes, Lettuce,	1 00
Samuel Hartwell, Collection,	1 00
C. E. Grant, "	1 00

JULY 30.

POTATOES.—Twelve, I. E. Coburn,	3 00
Second, C. D. Tuttle,	2 00
Third, Warren Heustis & Son,	1 00
SQUASHES.—Three Marrow, Josiah Crosby,	3 00
PEAS.—Half-peck of any variety, Sidney Lawrence,	3 00
Second, C. E. Grant,	2 00
SWEET CORN.—Twelve ears, J. G. Coolidge,	3 00
Second, Samuel Hartwell,	2 00
Third, C. N. Brackett,	1 00
TOMATOES.—Twelve, I. E. Coburn,	3 00
Second, C. N. Brackett,	2 00
Third, Samuel Hartwell,	1 00

Gratuities:—

C. E. Grant, Collection,	2 00
C. N. Brackett, "	2 00

AUGUST 6.

GREENFLESH MELONS.—Four, E. S. Converse,	3 00
BEANS.—Half-peck of Horticultural, P. G. Hanson,	3 00
TOMATOES —Twelve Acme, C. N. Brackett,	3 00
Second, William J. Martin,	2 00
Third, Samuel Hartwell,	1 00

Emery.—I. E. Coburn,	$3 00
Second, C. N. Brackett,	2 00
Third, Samuel Hartwell,	1 00
Any other variety, I. E. Coburn, Favorite,	3 00
Second, I. E. Coburn, Puritan,	2 00
Third, J. G. Coolidge, Perfection,	1 00
Egg Plant.—Four Round Purple, J. G. Coolidge,	3 00
Second, George Hill,	2 00

Gratuities:—

Joseph S. Fay, Bird's Cantelope Melon,	2 00
J. G. Coolidge, Pekin Egg Plant,	1 00
John Fillebrown, Collection,	2 00
C. E. Grant, "	2 00
C. E. Tuttle, "	2 00
C. N. Brackett, "	2 00
Samuel Hartwell, "	1 00

August 18.

Greenflesh Melons.—Four, Warren Heustis & Son,	3 00
Second, Samuel Rodden,	2 00
Sweet Corn.—Twelve ears, J. G. Coolidge,	3 00
Second, C. E. Grant,	2 00
Third, C. N. Brackett,	1 00
Egg Plant.—Four Round Purple, J. G. Coolidge,	2 00
Second, Samuel Rodden,	1 00

Gratuities:—

John Fillebrown, Collection,	2 00
C. N. Brackett, "	2 00
C. E. Grant, "	2 00

August 20.

Potatoes.—Twelve of any variety, I. E. Coburn,	3 00
Second, C. B. Lancaster,	2 00
Third, C. N. Brackett,	1 00
Sweet Melons.—Four of any variety, George Hill,	3 00
Second, Warren Heustis & Son,	2 00
Third, Samuel Hartwell,	1 00
Beans.—Two quarts of Large Lima, Benjamin G. Smith,	3 00
Second, C. N. Brackett,	2 00
Third, C. E. Grant,	1 00
Two quarts of Goddard, C. N. Brackett,	3 00
Peppers.—Twelve, C. N. Brackett, Squash,	3 00
Second, C. N. Brackett, Queen,	2 00
Third, C. Terry, Squash,	1 00

Gratuities:—

C. N. Brackett, Collection,	$2 00
C. E. Grant, "	2 00
Samuel Hartwell, "	1 00

AUGUST 27.

GREENFLESH MELONS.—Four, Samuel Hartwell,	3 00
PEPPERS.—Twelve, C. N Brackett, Squash,	3 00
Second, C. N. Brackett, Queen,	2 00
Third, Josiah Crosby,	1 00
SWEET CORN.—Twelve ears, Mrs. Mary T. Goddard,	3 00
Second, C. N. Brackett,	2 00
Third, C. E. Grant,	1 00

Gratuities:—

L. W. Weston, Sweet Corn,	1 00
C. N. Brackett, Collection,	2 00
C. E. Grant, "	1 00
Samuel Hartwell, "	1 00
M. W. Chadbourne, "	1 00
John Fillebrown, "	1 00

SEPTEMBER 3.

CABBAGES.—Three of any variety, C. N. Brackett,	3 00
Second, O. R. Robbins,	2 00
CELERY.—Four roots, C. A. Learned,	3 00
Second, H. T. Reynolds, Henderson's,	2 00
Third, " " White Plume,	1 00
BEANS.—Two quarts of Large Lima, Benjamin G. Smith,	3 00
Second, C. N. Brackett,	2 00
Third, C. E. Grant,	1 00
PEPPERS.—Twelve, C. N. Brackett, Squash,	3 00
Second, C. N. Brackett, Queen,	2 00
Third, C. Terry,	1 00

Gratuities:—

Samuel Hartwell, Collection,	2 00
C. E. Grant, "	2 00
C. N. Brackett, "	2 00

ANNUAL EXHIBITION.

SEPTEMBER 13, 14, 15, AND 16.

Special Prizes.

CAULIFLOWERS.—W. W. Rawson,	6 00
Second, A. M. Teel,	4 00

CELERY.—Four roots, C. A. Learned, ... $7 50
Second, W. W. Rawson, ... 7 50

Regular Prizes.

BEETS.—Twelve Turnip Rooted, W. W. Rawson, ... 3 00
Second, J. G. Coolidge, ... 2 00
Third, George F. Stone, ... 1 00
CARROTS.—Twelve Intermediate, W. W. Rawson, ... 3 00
Second, Mrs. Mary T. Goddard, ... 2 00
Third, John Fillebrown, ... 1 00
PARSNIPS.—Twelve Long, W. W. Rawson, ... 3 00
Second, C. A. Learned, ... 2 00
POTATOES.—Four varieties, twelve specimens of each, Mrs. M. T. Goddard, ... 5 00
Second. H. B. Watts, ... 4 00
Third, Joseph Brierly, ... 3 00
Twelve Clark, Mrs. M. T. Goddard, ... 3 00
Second, C. B. Lancaster, ... 2 00
Third, M. B. Faxon, ... 1 00
Hebron, H. B. Watts, ... 3 00
Second, Mrs M. T. Goddard, ... 2 00
Third, C. B. Lancaster, ... 1 00
Rose, C. B. Lancaster, ... 3 00
Second, C. D. Tuttle, ... 2 00
Third, M. B. Faxon, ... 1 00
Savoy, Mrs. M. T. Goddard, ... 3 00
Second, C. B. Lancaster, ... 2 00
Third, M. B. Faxon, ... 1 00
Any other variety, Mrs. M. T. Goddard, White Star, . . . 3 00
Second, " " " Charles Downing, . . 2 00
Third, " " " Peach Blow, . . . 1 00
SALSIFY.—Twelve roots, C. F. Curtis, ... 3 00
Second, M. W. Chadbourne, ... 2 00
Third, Benjamin G. Smith, ... 1 00
TURNIPS.—Twelve Flat, George F. Stone, ... 3 00
Twelve Swedish, R. A. Lovering, ... 3 00
ONIONS.—Twelve Danvers, George Hill, ... 3 00
Second, J. J. H. Gregory, ... 2 00
Third, C. A. Learned, ... 1 00
Portugal, George Hill, ... 3 00
Red, J. J. H. Gregory, ... 3 00
Second, George Hill, ... 2 00
GREENFLESH MELONS.—Four, G. E. Sanderson, ... 3 00
Second, Samuel Hartwell, ... 2 00
Third, Warren Heustis & Son, ... 1 00
WATERMELONS.—Pair, C. E. Grant, ... 3 00
Second, C. N. Brackett, ... 2 00

Third, Samuel Hartwell,	$1 00
SQUASHES —Four Canada, Mrs. M. T. Goddard,	3 00
Second, Josiah Pratt,	2 00
Third, George Hill,	1 00
Hubbard, W. W. Rawson,	3 00
Second, George Hill,	2 00
Third, John Fillebrown,	1 00
Marblehead, P. G. Hanson,	3 00
Second, R. A. Lovering,	2 00
Third, George Hill,	1 00
Marrow, P. G. Hanson,	3 00
Second, W. W. Rawson,	2 00
Third, R. A. Lovering,	1 00
Turban, P. G. Hanson,	3 00
Second, L. P. Weston,	2 00
Third, R. A. Lovering,	1 00
CABBAGES.—Three Drumhead, C. B. Lancaster,	3 00
Second, C. N. Brackett,	2 00
Third, Samuel Hartwell,	1 00
Red, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Savoy, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Third, C. B. Lancaster,	1 00
CAULIFLOWERS.—Four, A. M. Teel,	3 00
Second, W. W. Rawson,	2 00
Third, L. W. Weston,	1 00
CELERY.—Four roots of Boston Market, C. A. Learned,	5 00
Second, W. W. Rawson,	4 00
Third, Josiah Crosby,	3 00
Any other variety, C. A. Learned, Arlington,	5 00
Second, W. W. Rawson, Arlington,	4 00
Third, Joseph Brierly, White Plume,	3 00
HORSERADISH.—Six roots, W. W. Rawson,	3 00
Second, C. A. Learned,	2 00
Third, John Fillebrown,	1 00
BEANS.—Two quarts of Large Lima, C. N. Brackett,	3 00
Second, Benjamin G. Smith,	2 00
Third, C. E. Grant,	1 00
CORN.—Twelve ears of Sweet, O. R. Robbins,	3 00
Second, George W. Jameson,	2 00
Third, C. E. Grant,	1 00
Yellow or Field, twenty-five ears, traced, Mrs. M. T. Goddard,	3 00
EGG PLANTS.—Four Round Purple, J. G. Coolidge,	3 00
Second, George Hill,	2 00
Third, C. A. Learned,	1 00
TOMATOES.—Three varieties, twelve each, I. E. Coburn,	5 00

Second, C. N. Brackett,	$4 00
Third, George Hill,	3 00
Twelve Acme, C. N. Brackett,	3 00
Second, Joseph Brierly,	2 00
Third, J. G. Coolidge,	1 00
Emery, I. E. Coburn,	3 00
Second, George Hill,	2 00
Third, C. N. Brackett,	1 00
Paragon, George E. Sanderson,	3 00
Second, George F. Stone,	2 00
Third, George Hill,	1 00
Cardinal, C. N. Brackett,	3 00
Second, George F. Stone,	2 00
Third, George Hill,	1 00
Any other variety, I. E. Coburn, Favorite,	3 00
Second, R. A. Lovering, Livingston,	2 00
Third, George E. Sanderson, Livingston,	1 00
MARTYNIAS.—Twenty-four, M. W. Chadbourne,	2 00
PEPPERS.—Twenty-four, C. N. Brackett, Squash,	3 00
Second, " " Queen,	2 00
Third, " " Ruby King,	1 00

Gratuities:—

W. W. Rawson, Collection,	8 00
Oak Grove Farm, "	5 00
C. A. Learned, "	4 00
John Fillebrown, "	3 00
Samuel Hartwell, "	3 00
C. N. Brackett, "	3 00
C. E. Grant, "	2 00
P. G. Hanson, " of Squashes,	3 00
W. W. Rawson, Hybrid Squashes,	1 00
George Hill, Squashes,	2 00
J. G. Coolidge, "	2 00
William Richardson, "	1 00
M. W. Chadbourne, "	1 00
F. D. Barker, "	1 00
J. J. H. Gregory, Collection of Beans,	3 00
C. Terry, Watermelons,	2 00
C. H. Brackett, Mushrooms,	1 00

OCTOBER 1.

SALSIFY.—Twelve roots, Charles F. Curtis,	3 00
Second, Benjamin G. Smith,	2 00
Third, M. W. Chadbourne,	1 00
SQUASHES.—Three Hubbard, W. W. Rawson,	3 00
Second, Samuel Hartwell,	2 00

Marrow.—W. W. Rawson,	$3 00
Cabbages.—Three Drumhead, C. N. Brackett,	3 00
Second, Samuel Hartwell,	2 00
Third, C. B. Lancaster,	1 00
Three Red, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Three Savoy, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Third, C. B. Lancaster,	1 00
Cauliflowers.—Four, W. H. Teel,	4 00
Second, A. M. Knowlton,	3 00
Third, Samuel Hartwell,	2 00
Celery.—Four roots Boston Market, W. W. Rawson,	4 00
Second, Josiah Crosby,	3 00
Any other variety, W. W. Rawson, Arlington,	4 00
Second, C. A. Learned, Arlington.	3 00
Third, Mrs. Francis B. Hayes, White Plume,	2 00

Gratuities:—

C. A. Learned, Horseradish,	1 00
M. W. Chadbourne, Sweet Corn,	1 00
Mrs. E. M. Gill, Beans,	1 00
Benjamin G. Smith, Lima Beans,	1 00
I. E. Coburn, Collection of Tomatoes,	2 00
C. N. Brackett, Collection,	4 00
C. E. Grant, "	2 00
Samuel Hartwell, "	2 00

CHRYSANTHEMUM SHOW.

November 9, 10, and 11

Onions.—Twelve Danvers, W. H. Teel,	$3 00
Second, P. G. Hanson,	2 00
Third, R. A. Lovering,	1 00
Cucumbers.—Pair, C. H. Brackett, Brighton,	3 00
Second, " " New Variety,	2 00
Third, " " White Spine,	1 00
Cabbages.—Three Red, C. N. Brackett,	3 00
Second, Samuel Hartwell,	2 00
Savoy, Samuel Hartwell,	3 00
Second, C. N. Brackett,	2 00
Brussels Sprouts.—Half-peck, Mrs. M. T. Goddard,	3 00
Second, Charles F. Curtis,	2 00
Cauliflowers.—Four, A. M. Knowlton,	3 00
Second, W. H. Teel,	2 00
Third, George E. Sanderson,	1 00

CELERY.—Four roots, W. W. Rawson, Arlington,	$3 00
Second, C. A. Learned, Arlington,	2 00
Third, W. W. Rawson, Boston Market,	1 00
ENDIVE.—Four heads, M. W. Chadbourne,	3 00

Gratuities:—

W. W. Rawson, Lettuce and Horseradish,	2 00
George F. Stone, Lettuce,	1 00
A. S. McIntosh, Artichokes,	1 00
Mrs M. T. Goddard, Celery,	1 00
R. A. Lovering, Collection,	5 00
P. G. Hanson, "	5 00
Samuel Hartwell, "	1 00

NOVEMBER 26.

Gratuity:—

W. W. Rawson, Lettuce,	1 00

REPORT

OF THE

COMMITTEE ON GARDENS,

FOR THE YEAR 1887.

By JOHN G. BARKER, Chairman.

It again becomes our duty to present a report of our doings for the past season. The only application for any of the premiums was from Warren Heustis & Son, who entered their Market Strawberry Garden, which your Committee, with other invited guests, visited June 25. This garden was three-fourths of an acre in size, half an acre being old beds worked over, and the other one-fourth of an acre being new ground. The leading variety was the Belmont. The season was unusually short, the latter part being very hot, so as to bring it to a close quite suddenly, and Mr. Heustis estimates on that account a loss of at least 1000 baskets. As it was there were sold 3687 baskets, and what was used in the family and given away would add at least 300 more, making a total of 3987 baskets, or in round numbers 4000 baskets. Those sold brought a very satisfactory price. Mr. Heustis considers the past season not a good one for any kind of fruit, and says that strawberries suffered as much as any fruit, and that theirs were never poorer.

On page 346, Part II, of our Transactions for 1886, will be found a report on Mr. Heustis's grounds, especially on the strawberries, and our visit this season fully sustains what was then said. For the last three years Mr. Heustis has grown scarcely any other kind than the Belmont. Last year 3000 Jewells were planted, and there are but few more than that number now, as they have made scarcely any runners, but what they did make are looking

well. There were also planted some Cumberland, Jersey Queen, and Bay State, this last named, a seedling, raised by Mr. Heustis; but of this he does not feel justified in saying much at present. There were many other seedlings from the Jewell and Belmont, none of which have yet fruited enough for one to form any opinion of their merits, but another season may prove what they are. Mr. Heustis says that in raising seedling strawberries if he gets one good one out of two hundred he thinks that well worth trying for, and the Committee believe that in the future he will place upon our tables the proofs of his success as he has done in the past.

In addition to strawberry culture, Mr. Heustis, as is well known to most of us, has given attention to the cultivation of the Rose. The collection contains about 800 plants of the leading Hybrid Perpetual varieties, which have been planted from one to eight years. They are in beds 200 feet long by 12 feet wide, the rows running across the beds, each row being of a different variety. In most cases five of each have been planted, but in some, more than that number, the selection being from the best known kinds in cultivation. Those which were planted eight years ago were never more vigorous than at the present time. The plants were all budded and undoubtedly most of them have rooted above the bud, adding greatly to the strength of the plant. The fine display of flowers was ample proof of the high state of cultivation bestowed upon them, and greatly increased the pleasure of our visit.

The Committee award to Messrs. Heustis the First Prize of $30 for the best Market Strawberry Garden.

Wellesley, the Residence of H. H. Hunnewell.

Although not invited in an official capacity, your Committee enjoyed the pleasure of a visit, with other gentlemen, to this charming estate when the Rhododendrons and Azaleas were in their greatest glory. To prepare a detailed description of this elegant estate is a task not easily performed. The great progress made from year to year and the added beauty of the place as the trees and shrubs advance in size must be seen to be appreciated. The Rhododendrons form one of the greatest attractions of the place, and the interest Mr. Hunnewell has taken in their culture is a sufficient guarantee that the collection is one of the choicest, if not the very best on this side of the Atlantic. In

the various groups there are thousands of plants among which are many single specimens measuring fully ten feet in diameter. Their beauty can only be appreciated by seeing them; indeed, those who have never seen them can hardly imagine the gorgeous effect produced by the massing of these immense banks of flowers, and no description can do them justice. In color we see the pale blush, shaded purple, rosy crimson, pink, bright rose, delicate pale rose, deep crimson, deep scarlet, pinkish lilac, white, shaded lilac, carmine, — in fact nearly every conceivable color from a pure white to a deep, rich crimson. Of half hardy kinds, — that is, those that are housed in winter, there are about two hundred named varieties, both standards and dwarfs, a few of which are ten feet high and as much in diameter. These large plants require four men to lift them, so that the labor of moving them twice a year is very great, and spacious pits are required to store them in during the winter. Mr. Harris informed us that he makes a point of thoroughly soaking the roots of every tree before it is housed, and after all are planted in the pits they are well watered again, and get no more water until set in the open ground in April.

The rhododendron tent contains 9672 square feet and is 25 feet high at the apex. It is neatly and tastefully laid out in beds and borders, and in the centre is a spiral staircase with a platform at the top ten or fifteen feet from the ground, where a fine view of all the plants is obtained, giving an effect produced in no other way than by looking down on the plants. The splendid standard specimens which were so very attractive and admired by every one, were:

Onslowianum, a delicate waxy blush, with a yellow eye; very distinct.

Barclayanum, deep rosy crimson; a fine late blooming kind.

Scipio, rose, with a fine deep spot.

W. E. Gladstone, pink, fine truss.

Purity, white, with a faint yellow eye; very showy.

Mrs. Arthur Hunnewell, pink, with primrose centre; very pleasing.

Sir Joseph Whitworth, rich dark lake, spotted.

Duchess of Edinburgh, bright orange scarlet; very effective.

In a letter to the Chairman of the Committee, Mr. David Smith of the Old Scotch Rose Nurseries, Stranraer, Scotland, says: "I called on Mr. Harris at Wellesley, and saw the large collection of rhododendrons, which is quite equal to any private collection I

have seen at home, where the facilities for growing them are greater."

We found a great variety of climbers growing on the posts supporting the tent; several kinds of clematis were particularly noticeable and showy, and added much to the attractiveness of the tent.

Hardy Azaleas receive a large share of attention. Their beauty during the early spring season is greater than can be imagined. The profuseness of the blossoms and the brilliancy of their color, with not unfrequently a delicate and agreeable fragrance, give them qualifications of great importance for more general cultivation. Of all the hardy flowering shrubs where can be found such a variety of color — pink of almost every shade, scarlet, yellow, orange, and white? Many of the specimens at Wellesley were splendid large plants, showing a mass of bloom and each forming an exhibition of itself. In this connection we must not fail to mention the *Azalea mollis*, a recent introduction from Japan, the flowers of which are very large, and vary in color from primrose to red. They are very attractive and beautiful, profuse bloomers, and are so highly prized for their forcing qualities that it would be hardly possible to say too much in their favor.

The Azalea tent was a very attractive feature; it is of circular form and seventy-five feet in diameter. Here we saw some of the most magnificent specimens of Indian Azaleas ever known. Some of the plants are twenty-five years old and six or seven feet through, and the collection contains the best known varieties. New ones have been added from time to time until it now contains about one hundred varieties. In the centre of this tent fine specimens of palms were arranged, plunged in the grass, as were also the Azaleas, the latter being arranged in groups around the sides. Intermingled with the Indian Azaleas were some plants of *Azalea mollis* with yellow flowers of a very striking appearance, which enlivened the groups very much. As in the rhododendron tent a variety of climbing plants grew on the pillars. It would be an endless task to attempt any detailed account of the different plants in this collection, but it is not too much to say that the display is unequalled on this side of the Atlantic, as the thousands who every year come from far and near can testify.

It will be interesting to many to know how the plants are treated. We enjoyed a visit to Wellesley the early part of December and

found these plants stored in a pit about sixty feet square under the stable. In the same pit were Ivies, Araucarias, *Rhynchospermum jasminoides*, and the more tender varieties of Rhododendrons, such as Dalhousianum, Sesterianum, Gibsoni, Princess Alice, Mrs. J. Shaw, and others. These with the Azaleas are removed from the pit to the fruit houses about the 20th of April, and when in bloom removed to the tent. While in the pit only enough heat is given to prevent dampness, and the watering is carefully looked after about once a week.

The Italian garden is the most striking feature in the grounds. In the eighth edition of Downing's "Landscape Gardening," enlarged and revised by Henry Winthrop Sargent, Esq., at page 444, is an account of this garden, in which we are informed that it is the most successful, if not the only one, as yet, in the country. The description is illustrated by a plate, showing the balustrade with the steps leading down to the garden, and many fine specimens of topiary work, with a view of the lake beyond; and as we imagine the fine buildings of Wellesley College located on the other side of the lake, a scene of unequalled beauty is before us. The trees used for the topiary work comprise White Pines 35 feet high trimmed in tiers, others umbrella shaped, and many fine Norway Spruces 12 feet high in a variety of forms, and some perfect specimens 25 feet high. The European Larch is also quite a feature, yielding to the knife as readily as evergreens, and when starting into growth is very beautiful. Hemlocks, Arborvitæs, Junipers, and Retinosporas, with a few deciduous trees such as Beeches, Birches, Maples, etc., make up the whole. The number of trees under the shears is 260. There are also two large clumps of *Retinospora pisifera aurea* containing 50 plants each, trimmed so as to make a compact mass 10 feet in width, and two circular beds each with Purple Birch in the centre, and a carpet underneath 8 feet wide of *Euonymus radicans variegata* clipped close; also a bed of Arborvitæ in the centre, with Euonymus 7 feet across, and a mass of Hemlock with Purple Beech in the centre 10 feet high. The effect of this is very beautiful.

The great bank of Hemlocks 200 feet in length and 12 feet in width was originally planted in two rows about three feet apart, in order to form a dense mass. This has been accomplished to perfection, and at equal distances cones were raised and time has developed them so that they are now nearly ten feet above the

base. There are ten of these. While one can perhaps get some idea of the beauty of the garden from this report, no description can do it justice. It is the same with this as with the other features already described, — to be appreciated they must be seen.

Perhaps you have all noticed the extensive lawn and admired its breadth and seemingly perfect order; but Mr. Hunnewell, being pleased with nothing but the best, two years ago trenched the entire lawn, covering a space of nearly eight acres, about eighteen inches deep, at a large expense, and it is anticipated that another year a beautiful sward, with a fine, smooth surface, will be the result.

The Pinetum is now attracting a great deal of attention, and much interest is manifested in the elegant specimens there found. In the Report of the Garden Committee for 1874 the height of some of the rarest specimens was given, and, in order that some idea may be formed of the advance in the size of the trees, we here repeat that table with the addition of the present height:

	1874.	1887.
Abies Albertiana,	10 feet.	15 feet.
" *Douglasii*,	8 "	25 "
" *orientalis*,	20 "	25 "
Larix Kœmpferi,	8 "	25 "
" *leptolepis*,	25 "	50 "
Picea Cephalonica,	20 "	35 "
" *grandis*,	11 "	18 "
" *lasiocarpa*,	6 "	15 "
" *Nordmanniana*,	20 "	30 "
" *Pichta*,	25 "	30 "
Pinus Koraiensis,	10 "	18 "
" *Massoniana*,	10 "	18 "
Retinospora filifera,	4 " 6 in.	12 "
" *obtusa*,	13 "	20 "
" " *aurea*,	6 "	8 "
" *pisifera*,	8 "	14 "
" " *aurea*,	9 " 6 in.	15 "
" *plumosa*,	7 "	12 "
Thuja pendula,	9 "	14 "
Thujopsis dolabrata,	4 "	7 "

Our attention was directed to a splendid specimen of *Abies pungens*, 18 feet high, which is probably the finest in the New England States. It is of great beauty, and its light blue foliage, compact habit, and hardy character make it invaluable.

Abies Douglasii, now 25 feet high, was grown from seed on the place. Like the Norway Spruce, it varies in form, some specimens growing erect while the others are of a drooping habit.

Picea (*Abies*) *Cephalonica* is 35 feet high. This beautiful fir is a native of Mount Enos, the highest mountain of Cephalonia. Its foliage is dark green, unique looking, standing out like miniature bayonets.

Abies Parsonsi is 20 feet in height.

Abies concolor, Veitch's variety, which is more glaucous than *A. pungens*, and by many is thought to be decidedly handsomer, is described by Engelmann as forming a tall tree on the mountains in New Mexico, and somewhat resembles *A. grandis* in foliage.

Having thus taken a glance at the grounds, we will call attention to some of the plants seen in the houses. You all know that December is a poor month to look for much beauty in a greenhouse, but we found much to interest us. The first plant that attracted attention on entering was a splendid specimen of *Lælia albida*. The flowers were very large; the sepals and petals are pure white with a fine pink lip; and this superb specimen was grown in a basket two feet by one foot six inches. It is a beautiful winter blooming orchid.

Cypripedium insigne Maulii is a variety of *insigne* in which the upper petals are whiter and the whole flower appears better in color than the type.

Cypripedium Spicerianum, a beautiful species of the group to which *C. insigne* belongs, may be found figured in the Botanical Magazine, Vol. 106, plate 6490.

Cypripedium Dominianum is a cross between *C. caricinum* and *C. caudatum;* spike three flowered; petals greenish yellow, very long; lip purple, green, and yellow. This is a welcome addition to this interesting class of orchids.

Cypripedium Harrisonii. — This splendid variety is a cross between *C. villosum* and *C. barbatum*, combining all the good qualities of both, and is considered one of the very best.

Dendrobium Dearei. — One of the features of this charming Dendrobe is the fact that it lasts so long a time in bloom. Mr.

Harris says it will stay in bloom for ten weeks. The Dendrobes are all very beautiful, and there are in the collection 400 or 500 plants in twenty or thirty varieties.

Calanthe Veitchii is one of the most beautiful of deciduous orchids. There were many fine specimens, and one in particular is worthy of mention, having six spikes of bloom, each spike averaging thirty flowers, which are of a deep rose color.

Calanthe lutea oculata is a very pretty variety.

Phalænopsis grandiflora and *P. amabilis.* The latter has been called the "Queen of Orchids." *P. Schilleriana* is a magnificent species. These plants were in perfect health. The foliage itself is really beautiful, especially that of *Schilleriana.* The flowers are all very handsome, and continue a long time in perfection, which quality makes them of more than ordinary value.

Of Cattleyas, about 500 plants are grown in twenty or thirty varieties. The most noticeable are *Mossiæ*, and its varieties, *amethystoglossa*, *crispa*, *Trianæ*, and *Warnerii.* Cattleyas are justly ranked amongst the finest orchids. The flowers are large and elegant, and scarcely surpassed by any genus in brilliant richness and great depth of color, and those who visited Wellesley last spring undoubtedly remember the beautiful display in the conservatory.

Three fine specimens of *Cœlogyne cristata* have attracted our attention more than once; these are grown in pans twenty inches in diameter. This is a magnificent dwarf evergreen species, the flowers being produced from the bottom of the bulb, on a drooping spike, six or eight together. The color is pure white, with a blotch of yellow on the lip.

There are also about 500 plants of Odontoglossum. We have mentioned only a few of the larger specimens that attracted our notice. There are many hundred plants of the choicest varieties, selected with the greatest care, and all in the very best state of cultivation.

Foliage plants have always received a large share of attention, and the fine displays made at our exhibitions are well remembered by you all. Particularly attractive were the Dracænas. These handsome plants are deservedly very popular. Some can be used to advantage in the sub-tropical garden, and as house plants they are much to be desired; but for greenhouse and stove decoration we never saw any that equalled the superb specimens grown at

Wellesley. In addition to the finest named varieties, there were seedlings raised by Mr. Harris, than which there were none better. Particularly noticeable were superb specimens of Wellesleyana, Bella and Waban.

The Crotons were in splendid condition, and growing in the same house with the Dracænas. The combination displayed a richness of foliage unequalled in any other arrangement of fine foliage plants. The following were among the very best: *Evansianus*, *Williamsii*, *Johannis*, and *Queen Victoria*.

Sphærogyne latifolia was another elegant foliage plant, described by B. S. Williams as follows: "The stem and leaf stalks of this magnificent species are clothed with rough, light brown, reversed hairs. The leaves are opposite, a foot or more in length, ovate, and of a beautiful, rich, dark, olive-green in color on the upper surface, the under side being dull red. No collection of ornamental plants should lack this superb and elegant species. It is a native of Costa Rica."

Marantas were also noticed in splendid order. Their beautiful variegated foliage makes them well adapted for ornamental and decorative purposes in the stove and conservatory.

Tree Ferns. An elegant specimen of *Cyathea dealbata*, with some of the fronds eight feet long and in splendid condition, was much admired.

Cibotium regale was another elegant specimen, the fronds spreading twenty feet. The graceful habit and distinct appearance of tree ferns render them singularly beautiful and peculiarly adapted for conservatory and other decorative purposes.

Palms. *Areca lutescens* was a very beautiful specimen.

Areca Verschaffeltii.

Kentia Fosteriana.

Licuala Guadichaudii.

Phœnix reclinata is an elegant greenhouse palm.

Phœnix rupicola is said to be the most beautiful species of the whole genus.

Stevensonia Sechellarum.

Sabal umbraculifera was very fine, with fronds seven feet in diameter.

It would be difficult to find any class of plants better adapted for all kinds of decorative work than the palms. The dinner table, the window, the staircase, the church, the conservatory, the

lawn, the shady nook, and the flower garden, all seem to give them a welcome, and they always add grace and beauty to whatever place they occupy. The elegant specimens seen here verify this statement.

We noticed several fine specimen plants of Opuntias ten feet high, and also a variegated form. These large plants were, last summer, in the centre of an ornamental bed.

In one of the houses we were delighted at the sight of an old friend, *Bignonia venusta*, a magnificent specimen of which had on it scores of streamers of flowers four or five feet long. This plant was grown in a border not more than three feet by two, and the stem of the plant at the base was at least eight inches through. In pruning, it is cut, very much like a grape vine, to two eyes, in the month of May, and lasts fully six weeks in bloom.

On the opposite side of the house was another superb greenhouse climber, which follows the Bignonia in flowering,—the *Bougainvillea spectabilis*. When growing, Mr. Harris says, you cannot give it too much water, but the roots must be kept within bounds. This also is pruned after flowering, the same as a grape vine. These splendid greenhouse climbers should have a place wherever one can be given them.

In one of the storage pits were fifty elegant specimen plants of Holly, also Portugal Laurels, Yews, Euonymus, *Cryptomeria Japonica*, etc. We were informed that no harm would come to these plants if the mercury fell ten degrees below the freezing point, but cold winds must be kept out. There are three Rhododendron pits, eighty feet long by sixteen wide, in which 700 or 800 plants are stored.

In the rear of the Peach house a new house has been built. This is a cool house, and here were Orange plants, Acacias, Euonymus, *Lapageria rosea*, *L. alba*, and scores of other plants adapted to cool house culture.

The cool orchids are in a part of this house, being separated by a glass partition. These houses are constructed unlike most greenhouses, nothing being used that can rot. The walks and benches are all made of cement, the benches being supported by iron standards at the edges of the walks, with flat pieces attached to them at regular intervals, and running to the wall; this is all the support that is needed. To make these benches, a broad framework is made and placed where the under side of the bench will be, and cement of the desired thickness is laid on this framework, which remains three or four days that the cement may

thoroughly harden. This makes complete benches which no amount of dampness can affect. In the cool orchid house a cement tank, three and a half feet wide and five or six inches deep, runs the entire length of the front bench. This is kept filled with water, and is so arranged that it can easily be drained off, and fresh water can be supplied whenever needed. Everything is thoroughly done, and glass and iron in the roof, and cement walls, benches, and walks form a clean, substantial house.

There are in all thirteen houses, besides many outside pits and frames devoted to the various uses required for the successful carrying on of this beautiful and well managed place. We must not forget to mention that the crop of peaches and nectarines in the long ranges of glass (300 feet by 16) were as usual very fine and of superb quality.

Much might properly be added to this brief glimpse of Mr. Hunnewell's beautiful estate. The superbly arranged flower garden, admired by all, unique and beautiful of itself, deserves more than a brief mention, and perhaps we may be enabled to make special note of it another season. It is only justice to say that the entire place was in the best possible condition, and all that skill and art could do was here shown. To give a detailed description of the perfect beauty of the whole requires more ability, time, and space than your Chairman can command. We can do no less, however, than to extend to Mr. Hunnewell our hearty thanks for the kind reception we all enjoyed, and for his unbounded liberality in throwing open to the public his elegant grounds, the beneficial influence of which on the thousands who every year enjoy their beauty cannot be estimated. Our thanks are also due and heartily extended to Mr. Harris, who is always ready to give any information at his command, and to whom we are indebted for the facts, so freely given, which help to make up this report. We take pleasure in adding a letter from Mr. Hunnewell, which we are sure will be read with great interest by all.

Approved by the Committee, January 7, 1888.

JOHN G. BARKER,
J. H. WOODFORD,
E. W. WOOD,
C. N. BRACKETT,
CHARLES W. ROSS,
BENJAMIN G. SMITH,
HENRY W. WILSON,
Garden Committee.

MR. HUNNEWELL'S LETTER.

WELLESLEY, November 27, 1887.

Mr. John G. Barker:

DEAR SIR:

With special reference to our conifers, to the cultivation of which I have for many years given a good deal of attention, I hope my experience may be of some practical benefit to the public. It may possibly induce them to plant more of this class of ornamental trees, and an inspection of my collection may enable them to do so without the trouble and expense of testing the many different varieties, some of which I have found are not hardy in our severe climate. We have in our Pinetum, besides those scattered about in different parts of the place, over one hundred specimens of choice and rare evergreens, collected from all parts of the world, which have been planted from ten to twenty-five years, and a sufficient distance apart to allow the trees to grow and develop to full size without crowding each other. Most of them are now so large that they can be seen to the best advantage, and an idea can be obtained of the special characteristics of each variety. I have intended to give them good cultivation, and they are in a very healthy condition, but most of them were planted on what would be called a very poor gravelly soil, and though I have of late years improved its character essentially, still it is not, even now, of first quality, or the trees would show a much greater growth.

There is of course great uncertainty attending the introduction of foreign trees, but I have found that this question of hardiness ought not to be decided hastily, for I have frequently despaired of success, but have persevered, and after several importations have been finally rewarded with most satisfactory results.

Our trees have now been planted so many years, and have thriven so admirably, that there can surely be no doubt that with ordinary care they are perfectly hardy, and well adapted to our severe and trying climate; and any one who takes an interest in the matter can satisfy himself on this point by a personal inspection of our trees.

The *Picea Nordmanniana* is seen occasionally in this neighborhood, and we have a dozen or more fine specimens, thirty feet high, on the place. It comes from the Crimean mountains, and is

certainly a very beautiful tree, attaining, it is said, a height of one hundred feet, and will no doubt soon be more generally planted in this country.

I think favorably of the Japanese Retinosporas, which are charming trees, especially for moderate sized places, as they do not grow to a great height. The Spruces and Pines are likewise very desirable, being perfectly hardy and well adapted to our climate.

Abies polita, *A. brachyphylla*, and *A. Alcoquiana* are great acquisitions, especially the last, which is a grand tree and looks as if it would hold its beauty to a great age. The Umbrella Pine and *Pinus Koraiensis* must be great favorites and largely planted before many years, the latter retaining its foliage three years, a great advantage over our White Pine.

Truly yours,

H. H. HUNNEWELL.

REPORT

OF THE

COMMITTEE OF ARRANGEMENTS FOR 1887.

The reports of the Chairmen of the various Committees of the Society, anticipate so much that might be said by this Committee, and cover the work of the Society for the past year so thoroughly, that there remains little to be said, which will prove of value to the records. The receipts from the large exhibitions of the year 1887, have fallen off in a slight degree from the total of 1886, although the Chrysanthemum Show this year made a slightly better showing as to receipts than in 1886. In detail the receipts were as follows: Spring Exhibition, $1,213.55; Rose Show, $306.55; Annual Exhibition, $1,023.00; Chrysanthemum Show, $734.75. Total, $3,277.85, against the sum of $3,646.10 last year.

The experiment of holding the Annual Exhibition in the Mechanics' Building on the Back Bay, in conjunction with the Exhibition of the American Pomological Society, was, so far as the financial results are concerned, not as successful as it ought to have been, and it served to demonstrate in part at least, that the Society is fortunate in the present location of its building, which is easy of access to those who wish to attend our exhibitions. It would seem to be the future policy of the Society, to stimulate the improvement of the quality of all exhibits rather than to seek to enlarge the quantity of individual exhibits. The limited space at our command, renders this an imperative consideration, and our exhibitions will assuredly prove not only more attractive, but instructive and beneficial to horticultural interests, if this line of policy is adopted.

EDWARD L. BEARD,
Chairman Committee of Arrangements.

REPORT

OF THE

COMMITTEE ON THE MEETING

OF THE

AMERICAN POMOLOGICAL SOCIETY.

The Committee appointed to receive and to provide for the American Pomological Society at its Twenty-first Session, in Boston, in September last, make the following report:

Working in harmony with your Standing Committee of Arrangements, provision was made so that the exhibitions of the Pomological Society and also its sessions should be held in the Mechanics' Building in connection with the Annual Exhibition of this Society.

A goodly number of eminent horticulturists and scientific gentlemen from all parts of the country and from the Dominion of Canada were in attendance, and the papers which were read and the discussions which followed were of decided interest. The wide experience and thoughtful observation of such an intelligent body of observers when thus brought to a focus, must prove to be of great value. The volume of "Proceedings" of this Society will be essential to every horticulturist who wishes to be abreast of the discussions in the various departments of our art. Your Committee take the liberty to urge upon the members of our Horticultural Society that they also become members of the National Society, and thus not only entitle themselves to its publications, but contribute to the support of a most worthy and widely useful Society.

The exhibition of Fruits by the Pomological Society was more limited than was anticipated, owing to the comparative failure of the fruit crop at the West. Yet it was of interest and afforded points of comparison with our own products which were certainly

encouraging. Special mention should be made of the many seedling grapes, some of which were of decided interest, and also of the remarkable collection of 165 varieties by the T. S. Hubbard Company, of Fredonia, N. Y., undoubtedly the largest number of varieties ever brought together in this and perhaps in any country. This was a rare opportunity for identification and the comparison of merit. One gentleman from the West expressed himself as amply repaid for his journey by this one exhibit of grapes.

By the courtesy of the City of Boston, an excursion down the harbor and a visit to the Public Institutions were enjoyed by the Convention. Through the liberality of several members of our Society, a banquet was given to the members of the Pomological Society at the close of its session, which was largely attended by the members of both Societies. Hearty expressions of union and good cheer were given by our President and other distinguished speakers, and the session closed with a prevalent feeling that the bond of fraternal union had been strengthened.

WILLIAM C. STRONG,
BENJAMIN G. SMITH,
GEORGE W. FOWLE,
} *Committee.*

REPORT

OF THE

COMMITTEE ON WINDOW GARDENING,

FOR THE YEAR 1887.

BY MRS. H. L. T. WOLCOTT, CHAIRMAN.

The Committee on Window Gardening, in submitting the list of prizes awarded, desire to state that the success of the last year was most encouraging. Parents and teachers became conscious of new interests in homes through this simple organization.

The unavoidable necessity of detaining young children from their homes for so long a part of the day, in bringing their plants to the hall, and returning with them, became objectionable before the end of the season.

After some delay, and in order to overcome other difficulties, halls have been obtained through the coöperation of others (Mr. Nathaniel J. Bradlee, the Church of the Good Shepherd, and the North End Industrial School). By this means we hope to enlist cordial sympathy in the aims and work of the Committee, and eventually to secure sectional Committees, who will take charge of the various exhibitions, reporting always to the Committee on Window Gardening, at Horticultural Hall, Tremont Street, Boston.

H. L. T. WOLCOTT, *Chairman*,
E. M. GILL,
L. P. WESTON,
S. W. STORY,
M. B. FAXON, *Secretary*,
} *Committee.*

PRIZES AND GRATUITIES AWARDED FOR WINDOW GARDENING.

JUNE 4.

Gratuities:—

Alexander Phillips, Geranium,	$ .15
Vera Gray, "	.15
Esther Lee, "	.10
Samuel Wellington, "	.10
Grace Witkins, "	.10
Sarah Witkins, "	.10
Florence Phillips, "	.10
Percy Phillips, "	.10
Ethel C. Brown, Fuchsia,	.30
Mary Laffry, "	.20
Annie Gray, "	.15
Callie Gray, "	.15
Thomas H. White, "	.10
Mary Dowd, "	.10
Maggie Phillips, "	.10
Minnie Witkins, Heliotrope,	.05
Nellie Moriarty, "	.05
Everett Brooks, "	.05
Jennie Murphy, German Ivy,	.10
Mary Moriarty, English Ivy,	.05
Annie Moriarty, " "	.05
Abbie F. Brown, Fern,	.15

JULY 2.

ROSE.—Single plant in pot, the Second Prize to John Henrickson,	.50
FUCHSIA.—Single plant in pot, the Second Prize to Mary Degnan,	.50

Gratuities:—

Thomas Dowd, Rose,	.25
Ethel O. Brown, Geranium,	.10
Sadie Foster, "	.10
Vera Gray, "	.10
Freddie Benway, "	.10
Clara Wellington, "	.10
Percy Phillips, "	.05
Josephine Mullen, "	.05
A. Phillips, "	.05

F. B. Phillips, Geranium,	$ .05
P. J. Degnan, "	.05
Abbie F. Brown, Fuchsia,	.10
Annie Gray, "	.10
Callie Gray, "	.10
M. Phillips, "	.10
Julia Henrickson, "	.05
Mary Dowd, "	.05
A. F. Brown, "	.05
Ethel C. Brown, "	.05
Ethel C. Brown, Heliotrope,	.10
Lizzie Dowd, "	.05
Abbie F. Brown, Oxalis,	.10
Annie Moriarty, English Ivy,	.10
Mary Moriarty, " "	.10
Abbie F. Brown, Tradescantia,	.10
" " Box of Mignonette,	.10
Ethel C. Brown, " Sweet Alyssum,	.10

JULY 9.

NATIVE FLOWERS.—Collection of Native Cut Flowers, Walter E. Coburn,	1.25
The Third Prize to Walter E. Coburn,	.75

AUGUST 6.

HELIOTROPE.—Single plant, the Second Prize to Mary Goodman,	.50

Gratuities:—

Thomas Dowd, Rose,	.10
Michael Graham, Geranium,	.20
Freddie Benway, "	.20
Sadie Foster, "	.20
Mary O'Hearn, "	.10
Jennie Murphy, "	.10
Maggie Kelly, "	.10
Maria Kelly, "	.10
Arthur Westerbury, Fuchsia,	.15
Mary Dowd, "	.15
Annie Moriarty, English Ivy,	.20
Mary Moriarty, " "	.15
Lizzie Kelly, " "	.10
Edward Reynolds, " "	.10
Eddie Westerbury, Heliotrope,	.20
Lizzie Dowd, "	.10
Mary Ann Garrity, "	.10
J. Reynolds, "	.10

SEPTEMBER 8.

Gratuities:—

Annie Anderson, Geranium,	$ .20
Freddie Benway, "	.20
Grace Witkins, "	.20
Daniel Riordan, "	.15
Joseph Haggerty, "	.15
Lillie Witkins, "	.15
Thomas Dowd, "	.15
Lizzie Dowd, "	.15
Maggie Kelly, "	.15
Maria Kelly, "	.15
Thomas White, Fuchsia,	.20
Mary Dowd, "	.15
Isabella Wood, German Ivy,	.20
Julia Riordan, English Ivy,	.15
Peter Haggerty, " "	.20
Mary Moriarty, " "	.20
Annie Moriarty, " "	.20
Lizzie Kelly, " "	.15
Bertha Pryor, " "	.15
Mary Riordan, Heliotrope,	.15

SEPTEMBER 10.

ROSE.—Single plant in pot, the Second Prize to Marguerite R. Harriman,	.50
GERANIUM.—Single plant in pot, a Second Prize to Louisa Feyertag,	.50
Second Prize to Anna M. Severance,	.50
" " Josie Speigel,	.50
" " Sarah Wilkins,	.50
Third Prize to Emma Peterson,	.25
" " John Stevens,	.25
" " Bertha M. Pryor,	.25
" " Peter Haggerty,	.25
" " Gertie Gunther,	.25
" " Josephine Severance,	.25
" " Sadie Foster,	.25
HELIOTROPE.—Single plant in pot, the First Prize to Mary Goodwin,	.75
Third Prize to Nannie Feyertag,	.25
FUCHSIA.—Single plant in pot, William Garren,	.75
Second, Mamie Cotter,	.50
Third, Annie Curley,	.25

Gratuities:—

John E. Henrickson, Rose,	.15
Anselino Bianchi, "	.10
Lillian B. Sportsman, "	.05

Freddie Benway,	Geranium,	$ .25
Mary Dolan,	"	.20
Annie Anderson,	"	.20
Josie Rorke,	"	.20
Joseph Haggerty,	"	.15
George Bloom,	"	.15
Minnie Feyertag,	"	.15
Maggie Keniley,	"	.15
Patrick J. Degnan,	"	.15
Annie Denks,	"	.15
Grace Wilkins,	"	.15
James Roach,	"	.15
Julia Lanborguini,	"	.15
Laura Randolph,	"	.15
Mary Dowd,	"	.15
Lizzie Dowd,	"	.15
Thomas Dowd,	"	.15
Mary Garren,	"	.15
Daniel Riordan,	"	.10
Lino Gregori,	"	.10
Adele Gregori,	"	.10
Joseph Bianchi,	"	.10
Maria Kelly,	"	.10
Stanley Ward,	Heliotrope,	.25
Tony Favello,	"	.25
Joseph O. Severance,	"	.20
Mabel Gunther,	"	.15
Alice Keniley,	"	.15
Mary V. Cisco,	"	.15
Elio Gregori,	"	.10
Diago Bianchi,	"	.10
Thomas White,	Fuchsia,	.25
Arthur Westerbury,	"	.15
John Sullivan,	"	.15
Julia Henrickson,	"	.10
Mary Degnan,	"	.10
John Bianchi,	"	.10
Emma Gregori,	"	.10
Mary Riordan,	"	.10
Nellie Bloom,	German Ivy,	.20
Eliza Gregori,	" "	.10
Lillian B. Sportsman,	Marigold,	.25
Mary Severance,	English Ivy,	.25
John Shanahan,	" "	.25
Mary Gunther,	" "	.20
Charles Tarello,	" "	.20
Helen Lane,	" "	.20

Peter Haggerty,	English Ivy,	$ .15
Madaline McHallan,	" "	.15
Ida Feyertag,	" "	.15
Leopold Maurer,	" "	.15
Bertha M. Pryor,	" "	.15
Edith Denks,	" "	.15
Ethel A. Cisco,	" "	.15
Raymond O. Delancy,	" "	.15
George Wentworth,	" "	.15
Annie Moriarty,	" "	.15
Mary Moriarty,	" "	.15
Lizzie Kelly,	" "	.15
Julia Riordan,	" "	.10
Emilio Gregori,	" "	.10
Eva Sportsman,	" "	.10
Grace Sportsman,	" "	.10
Joseph Wentworth,	" "	.10
Julia Lanborguini,	" "	.10
Grace Sportsman,	Nasturtiums,	.10
Eva Sportsman,	"	.10
Sadie Sportsman,	"	.05

REPORTS

TO THE

STATE BOARD OF AGRICULTURE.

Beginning with the year 1885 the Society has elected a member of the State Board of Agriculture, and has performed such other acts as were necessary to entitle it to the bounty of the State, and the Board has appointed a member to report on the exhibitions and other work of the Society. It having been suggested that the report for the year 1887 should be printed in the Transactions of the Society, the Committee on Publication have not only approved that suggestion, but have determined to publish also the two previous reports, as follows:

REPORT FOR 1885.

BY HON. JAMES S. GRINNELL, OF GREENFIELD.

I was appointed from this Board to report on the Massachusetts Horticultural Society, and have attended its shows of fruits, flowers, and vegetables, and some of its weekly meetings, most interesting in the display of practical results, and in the exposition of scientific theories and of experimental work.

The fact that this Society had never until last year, when under the presidency of Mr. John B. Moore, allied itself with the State Board of Agriculture, and has never before been represented here by a delegate or by a report, justifies me in giving for the information of those who are not of its membership, a brief sketch of its origin and early history. The first production from the soil which our forefathers found when they landed on the cheerless shore of Massachusetts Bay, except the leafless forest trees of December, was some seed of that noble plant, the maize, which not only saved their lives, but which in all succeeding generations

of their descendants for more than two hundred and sixty years has been a prime factor of their sustenance and of their prosperity.

The following spring and summer, however, developed to their delighted gaze and to their longing appetites an abundance of grapes, white and black, strawberries, gooseberries, raspberries, and many others; plums, nuts, and a profusion of roses; but the apple, the pear, and the peach, were not indigenous to this country, and the civilized hand had not stretched across the wide Atlantic to sow their seeds. They found the soil, where the Indians had cleared by burning and with their clam-shell hoes and their fish for fertilizer had grown their corn, their beans and their pumpkins, fertile and responsive to whatever was done for it. The colonists were rather slow in introducing fruit trees, and it was not till after 1640 that these were propagated to any merchantable extent.

Gov. Endicott was apparently one of the first to make this any considerable business; his farm was known by the name of "Orchard." In 1645 he wrote his son that he had engaged to sell fifteen hundred apple trees; and in 1648 he exchanged five hundred apple trees with William Trask for two hundred and fifty acres of land.

An indication of the interest early shown in horticulture is the act of 1646, imposing penalties for robbing an orchard or garden, or injuring any graft or fruit tree.

The general cultivation of fruit increased slowly, though in 1654, thirty-four years after the first settlement, Gov. Bradford, in a rather rough poem, wrote — "Pears, apples, cherries, plums, quince, and peach, are now no dainties, you may have of each." But early in 1700, apples and also pears and peaches are spoken of by Chief Justice Dudley as abundant. Apples were especially so, for in one village near Boston, of only forty families, they made three thousand barrels of cider in 1721, and in another town of four hundred families, he says, "they made ten thousand barrels, some apple trees making as many as six and seven barrels of cider; but this is not common, though from seven to nine bushels of apples will yield a barrel of cider." Nearly another century passed before any associated action was taken here to promote horticulture, or the propagation and cultivation of fine fruits, although in the milder and more genial climate, south of New York, at Philadelphia, and below that, much had been done.

In 1822 Hon. John Lowell wrote that "We are utterly destitute in New England of nurseries for fruit trees on an extensive scale; we have no cultivators on whom we can call for a supply of the most common plants of the smaller fruits, such as strawberries, gooseberries, and raspberries of the superior kinds. We have no place to which we can go for plants to ornament our grounds. We have not a single seedsman who can furnish us with fresh annual seeds on which we can depend and place a reliance." He added: "Shall it be said that from June to September, in our scorching summers, a traveller may traverse Massachusetts from Boston to Albany, and not be able to procure a plate of fruit except wild strawberries, blackberries, and huckleberries, unless from the hospitality of some private gentleman."

In accomplishing the wondrous change wrought in the sixty years and more since that time; in the increase and the perfection of fruits and flowers, no factor so potent as the Massachusetts Horticultural Society has existed and acted. The Massachusetts Society for Promoting Agriculture, having as its founders and first members several of the most prominent and far-seeing men, and some among them the most wealthy, in the Commonwealth, was incorporated in 1792, and by its corporate action, the efforts of its individual members, and by the publication of the "Massachusetts Agricultural Repository," which from the first contained articles devoted to Horticulture, accomplished a vast deal in shaping sentiment, and preparing the way for the formation and incorporation of the Horticultural Society.

A few books and journals on horticulture had been published; horticultural societies had been incorporated in New York and in Philadelphia. Kenrick, Winship, and Manning—honored names—had established in or near Boston, nurseries which became quite extensive; the time had come, and prominent men in Boston interested in the subject, for general good, determined on some definite action, and their ideas finally crystallized and took form by the incorporation in 1829, of the Massachusetts Horticultural Society "for the purpose of encouraging and improving the science and practice of horticulture, and promoting the amelioration of the various species of trees, plants, and vegetables, and the introduction of new species and varieties," and with the right to purchase and hold real estate.

For several years preceding this, the unwisdom of interring the

dead beneath the churches, and in the church-yards attached, had been a matter of thought and anxiety among many of Boston's wise and careful men, and although attempts had been repeatedly made to secure a tract of land, large enough, varied enough in character, and near enough to Boston, suitable for a rural cemetery, none which met these requirements, and which could be purchased, had up to this time been found. Boston had been incorporated as a city but seven years previous to the organization of this society; from 1630 to 1822 she had gloried in the pride of her Puritan government; of selectmen managing the affairs of the town, as directed by the people in that most Democratic of all Governments under heaven, the "Town Meeting." But since that, in 1829, she had wonderfully increased her population from forty to sixty thousand, and her valuation from eighty millions to eight times that. The territory was limited, and there was a very general and spontaneous feeling that intramural sepulture must be stopped.

About a year after the incorporation of this Society, a suitable tract of land, sixty acres in extent, was found lying in the towns of Cambridge and Watertown, and as the Society wanted land for an experimental garden, it was thought wise by its leading members, and those most active in the cemetery project, that the whole should be bought and placed in charge of the Society, which should reserve and use what was necessary for a garden, thus securing the most intelligent care of the grounds, and giving an added beauty to the cemetery.

The land was bought by a subscription of those who thereby constituted themselves as members, and in the spring of 1831, the Legislature authorized the Massachusetts Horticultural Society in addition to the powers already conferred on it, "to dedicate and appropriate any part of the real estate, now owned or hereafter to be acquired by them as and for a rural cemetery or burying ground, and for the erection of tombs, cenotaphs, or other monuments for and in memory of the dead;" and on the 24th of September following it was dedicated with proper and imposing ceremonies.

Thus it is that to the Massachusetts Horticultural Society, we owe the selection, purchase, and consecration of Mount Auburn, this lovely rural cemetery, in location, character, natural and artificial beauty unequalled in this country.

Had the Massachusetts Horticultural Society never accomplished anything but this, it would stand pre-eminent in its work, and its name would rise to heaven as a sweet incense of hallowed memories to the thousands who have in these many years laid beneath that consecrated sod all that was mortal of those they had loved and lost. In subsequent years a Cemetery Association was incorporated which took the management of the grounds, while the Society continues to receive annually a liberal sum from the proceeds of the sales of lots.

The Society has gone on with unvarying success. It owns the handsome granite building where all its exhibitions are held, which it built in 1865, and has also a large income, a great part of which is expended in premiums.

This building, however, is not large enough for the Society's increasing requirements, and it is highly probable that before another century opens it will be in the occupancy of much larger and more elegant rooms in a more commodious part of the city.

The Society holds weekly meetings every Saturday during the winter months, at which is usually read an essay, either by some one of the very competent members or by some scientist invited from abroad. Following this is a discussion on the subject of the lecture, full of interest and instruction, as is also the animated talk that arises on an infinity of subjects among an assemblage of experts in the special matters that are constantly called up by curious, or by superior specimens of cultivation.

There is nowhere in this part of the country such a source of horticultural and arboricultural knowledge and information as springs from these weekly meetings in the Society's rooms, and I should suppose that any person in Boston or its vicinity who has any interest in fruits and flowers, or, I should more properly say, their production and cultivation, would, if admittable, join this Society and attend its meetings.

The Society has also during the year, four most interesting public shows for the display of fruits, flowers, and vegetables. Some of these cannot be equalled in any city of the United States. The premiums offered for all these articles are on a most liberal scale, amounting annually to over five thousand dollars.

The Spring Exhibition is in March, when are largely shown greenhouse and pot plants, with such fruits and vegetables as may then be in season.

Late in June is held the Rose and Strawberry Exhibition, where is such a magnificent display as well justifies the title of Queen of Flowers to the rose, and also intensifies our faith in the opinion of old Dr. Butler, who, according to Izaak Walton, said that "doubtless God could have made a better berry than the strawberry, but doubtless God never did."

The Annual Exhibition in September is a very grand show of hot-house plants, flowers in pots, cut flowers, and bouquets, fruits of all kinds, and vegetables perfect in their varieties and in their forms. These, as a collection of object lessons in the school of horticulture, should be visited and studied by every one who has or can make the opportunity.

The fourth great exhibition occurs in November, especially for the exposition of that very popular flower, the Chrysanthemum, of which there were hundreds of every variety and known hue. Splendid specimens of apples, pears, and vegetables were also exhibited.

There are also prize exhibitions of fruits, flowers, and vegetables, every Saturday in July, August, and September, until the Annual Exhibition.

These frequent meetings and exhibitions develop to the full all the skill and energy of these growers about Boston. They criticise each other's operations,—approve and adopt, or reject,—they communicate each to the other their modes of cultivation—or if one does not, and only shows results — the others set themselves to find the secret of his success, and to surpass it.

Every one strives to excel in whatever he undertakes. He has to, to live. They make their living by the most careful, intelligent, skilled labor in their profession.

If farmers were so situated as to have such gatherings, the character of much of their farming operations would change greatly to their profit. The splendor of these shows is greatly enhanced by the free-handed liberality of wealthy gentlemen living not only in Boston, but in some cases miles away, who willingly send by wagons and by cars the most costly and splendid productions and ornaments of their greenhouses, often at no small hazard and loss. Nor should those skilled and painstaking gentlemen who produce and care for these rare and gorgeous plants be passed without a most honorable mention.

The influence of this Society has been extended and far reaching

beyond that of any similar association in this country. It has been largely instrumental in surrounding Boston with elegant gardens and pleasure grounds, surpassing the suburbs of any American city. It has stimulated the growth, introduction, and refined cultivation of the choicest and most useful trees, plants, flowers, and vegetables, and has accomplished more than any other agency in improving the markets, not only of Boston, but of all Massachusetts and New England. Its library, the most complete in this country if not in the world, as a specialty, is a perennial mine of agricultural learning.

Its publications have exerted a most wide-spread influence in the cultivation throughout the country of the best and most useful of all things growing out of the earth for our health and our enjoyment. Its members and correspondence extend throughout all refined countries, even to China and far Japan.

As citizens of Massachusetts we may well be proud of such an institution. As farmers and cultivators of the soil we should appreciate the benefits we have received from it, directly and indirectly. As members of this board we are happy in seeing it represented among us.

REPORT FOR 1886.

BY JAMES P. LYNDE, M. D., OF ATHOL.

The report of the Hon. James S. Grinnell upon the Horticultural Society last year was so comprehensive and exhaustive, covering its history, methods, work, and financial standing, that it is only left for me to review the past year's transactions and consider their influence upon progressive agriculture.

The sum appropriated for premiums was over $6,000, distributed through four exhibitions held in March, June, September, and November, covering a period of from two to four days each, to which an admission fee was charged, and thirteen weekly prize exhibitions from May 8, to October 2, open from 12 to 3 o'clock, on Saturdays, which were free to the public.

Thirteen meetings for Essays and Discussions, free to all interested, were held during the winter and spring, at which the following topics were considered.

Jan. 16. A Trip to the Tropics, by Joseph H. Woodford, Newton.

Fruits that Promise Well, by E. W. Wood, West Newton.

Jan. 23. The Forest Interests of Massachusetts, by William C. Strong, Newton Highlands.

Jan. 30. Forestry, by Rev. J. B. Harrison, Franklin Falls, N. H.

Feb. 6. The Gladiolus, by William E. Endicott, Canton.

Feb. 13. Bulbs and Tubers for Out-door Culture, by Mrs. T. L. Nelson, Worcester.

Feb. 20. The Food Question, by Edward Atkinson, Boston.

Feb. 27. Vegetable Growing, by Warren W. Rawson, Arlington.

March 6. The Progress of Orchid Culture in America, by Edward L. Beard, Cambridge.

March 13. Homestead Landscapes, by Dr. G. Austin Bowen, Woodstock, Conn.

March 20. The Care and Embellishment of Cemeteries, by John G. Barker, Jamaica Plain.

March 27. Nitrogen: Why the Crops Must Have it and Where They Must Get it, by Professor C. G. Caldwell, Ithaca, N. Y.

April 3. The Nomenclature of Fruits.

April 10. The Ripening and Preservation of Fruits, by Hon. Marshall P. Wilder, Dorchester.

This is a brief outline of the year's work. The essays and discussions are embodied in the Society's publications, and are of great value. Vegetables, fruits, and flowers are the specialties that receive attention.

The four principal exhibitions are held in the two large halls in the Society's building in Boston,— fruits and vegetables in the lower, and flowers and plants in the upper hall. At these exhibitions the display of flowers and plants completely filled the upper hall, presenting a scene of enchanting beauty, especially in the evening under the mellow radiance of the electric light. The weekly shows are held in the lower hall.

Who can describe a rose,— the queen of flowers,— an orchid, a chrysanthemum, a rainbow, a glorious sunset, or the glittering sapphires and rubies, painted by a morning sunbeam in a drop of dew? The pen of another must record the beauty and perfume of these floral collections. Every specimen was an object lesson

in itself, many of them of great value and of absorbing interest to all beholders. The mystic goddesses of horticulture, Pomona and Flora, held high court, displayed their rich treasures, and received the homage of their votaries.

We have stood before the statue of one we have known, honored, and loved; so faithfully had the artist wrought, that the cold insensate marble seemed instinct with life, and to our imagination the inarticulate lip and sightless eye would almost seem to move in recognition of our presence.

We have looked upon a picture of the great Nazarene, painted by the hand of an old master with such perfection that the countenance seemed so illumined with an expression of grace, pity, and love that we could almost feel the influence of His personal presence, and we have looked and turned away, only to return spellbound with tender admiration.

Who has not felt the mysterious influences and been moved in the profound depth of consciousness by the "divine art" of Mozart, Handel, and Beethoven? What an inspiration to deeds of heroic self-sacrifice for real or supposed good! And what a source of comfort, pleasure, and happiness to mankind, holding its power through the ages over all races of men!

Can we not properly claim a place as a companion of high art for skilled Horticulture, which, directing the forces of nature, evolves from the lifeless clod objects of utility and beauty, crowned with blessings and delights far excelling in perfection works of sculpture and painting, speaking to human hearts through a silent language as suggestive and uplifting in influence and culture as the finest music? Therefore is she not entitled to at least honorable mention and high rank among the so-called Fine Arts?

"Your voiceless lips, O flowers, are living preachers,
Each cup a pulpit, every leaf a book,
Supplying to my fancy numerous teachers
From loneliest nook.

"Were I in churchless solitudes remaining
Far from all voice of teachers and divines,
My soul would find in flowers of God's ordaining
Priests, sermons, shrines."

—Horace Smith.

The work and influence of this Society is a constant public benefaction, by the introduction of new and improved varieties of vegetables, fruits, and flowers, and illustrating the best methods of their cultivation, stimulating the ambition of people to improve and excel in these specialties. Some one has said that no person could eat of our choicest grapes, apples, and pears without being indebted to the genius of Marshall P. Wilder.

The influence of the Society is not confined to this or the New England States. Its members and patrons are, many of them, the most successful cultivators of gardens, fruits, and flowers in this country or the world; and wherever horticultural societies have been organized in this or other countries, even in distant Japan, its influence is felt. It was incorporated in 1829, and is, with the exception of the Pennsylvania Horticultural Society, the oldest in the country. It has steadily increased its membership, enlarged its plans, collected its valuable library, prospered financially, extended its influence and established its reputation in this and other countries as one of the leading horticultural societies in the world. It has outgrown its once ample accommodations and is perplexed with the problem of their enlargement.

It was a happy thought that suggested a union of this Society with this Board of Agriculture and the other societies. All will be benefited. We needed its help and influence, perhaps, far more than it needed ours. Let us endeavor to make the relation mutually pleasant and helpful.

Almost at the close of the year we were startled by the sudden death of the Hon. Marshall P. Wilder, at the ripe age of eighty-eight. He had been connected with this Society fifty-six years, and was more widely known and more prominent than any other member. He was the father of this Board of Agriculture, and an active member thereof since its organization in 1851. He was the father of the Agricultural College and one of the trustees for many years and one of its chief benefactors. He was the father of the American Pomological Society, and, (with the exception of one year) its president since its organization thirty-eight years ago. He was for twenty years President of the Norfolk Agricultural Society and on his retirement was made Honorary President. In 1852, he assisted in forming the United States Agricultural Society and was for six years its President.

He was an active or honorary member of many societies at

home and abroad. He was distinguished in military, political, and masonic circles, and as a citizen was held in high esteem. He was a man of fine personal presence and bearing,— honest, true to his friends,— and a Christian gentleman.

This Board shares with the Horticultural Society in a deep sense of loss by his removal from earth, and will cherish his memory with affectionate regard.

He wooed Nature with a passionate love, ministered at her altar, sought for her secrets with which to bless mankind.

"For all his life was poor without!
O, Nature! make the last amends;
Train all thy flowers his grave about
And make thy singing birds his friends.

"Revive again, thou summer rain,
The broken turf upon his bed!
Breathe, summer wind, thy tenderest strain
Of low, sweet music overhead!

"With calm and beauty symbolize
His peace, which follows long annoy;
And lend our earth-bent, mourning eyes
Some hint of his diviner joy.

"For safe with right and truth he is,—
As God lives he must live alway,
There is no end for souls like his;
No night for children of the day."

— WHITTIER.

REPORT FOR 1887.

BY HENRY H. GOODELL,

PRESIDENT OF THE STATE AGRICULTURAL COLLEGE, AMHERST.

In visiting the exhibitions of the Massachusetts Horticultural Society, one feels inclined to apply the words found in the first book of Moses, where, after seeing that the earth brought forth grass and herbs, yielding seed after his kind, and the tree yielding fruit, whose seed was in itself after his kind, the verdict was "that it was good." Where so much is good, it becomes difficult to know just how to measure one's praise.

A Society which, for fifty-nine years, has held its Annual Exhi-

bitions of fruit and flowers and offered its prizes for excellence, open to the competition of all, has been a factor for good in the horticulture of the State which no one can estimate.

Of the four exhibitions held during the year, your delegate attended three, being prevented from being present at the Rose and Strawberry Show, in June, by the duties of Commencement week. There were several noticeable features about these exhibitions deserving of special mention. That of March, aside from the magnificent show of hyacinths, narcissi, and tulips, stimulated by the medals offered by the Royal Union of Haarlem, Holland, for the encouragement of the growth of bulbs, was the wild flower garden from the Botanic Garden, Harvard University, a charming arrangement of rocks, pine trees, and moss, in which were blossoming all the favorites of the early spring. It was like being transported at a single bound, from the rigors of a northern winter to the balmy woods, dank with green moss and fern, and bright with its harvest of anemones and violets. Here were to be found all the commoner wild flowers, as well as those more rare, Trilliums, Columbines, Cowslips, Lady's Slippers, etc,— and, to make the illusion more complete, here and there even the skunk cabbage reared its fragrant spathe. It was a pretty idea — that of bringing the woods to your very door, and one to be imitated.

Shakespeare says :—

> "This is an Art
> Which does mend Nature : change it rather; but
> The Art itself is Nature,"

and after all, the nearer we come to nature, the better we succeed.

On the Continent of Europe, the floral exhibitions have all the appearance of show flower gardens. Fountains are playing, birds are singing, and you walk about in extensive grounds, laid out in beautiful plats, in which the pots are buried deeply in the earth, turf being carefully adjusted so that the plants seem to be springing from the ground itself. As a result, there is a harmony and naturalness which is peculiarly delightful. Again, the art of arrangement is carefully studied, so as to produce the best effects. As regards this last particular, it seemed to your delegate that there was a defect in the exhibition now reported on, especially in the upper hall. The stand of azaleas occupying the centre was too stiff and cold, if such a term may be applied to a mass of

color. The azalea, as a plant, is in itself stiff, and the greater pains are requisite to cover this up. The group should have been more raised in the centre. On the other hand, the further stand of cinerarias, with roses as a centre-piece, was too much raised in the centre, and the effect was again lessened, but from an opposite cause.

There is one more point in which the example of our brothers on the Continent might be profitably followed, and that is in the encouragement given to the young to engage in horticultural pursuits. Special prizes are offered to them for flowers, fruits, and the best cultivated plots of ground, and every effort is made to awaken in them a taste for the cultivation of the earth and to employ the best methods. Ten years ago, in response to a request signed by Rufus Ellis, Henry W. Foote, and C. A. Bartol, gentlemen "interested in advancing a practical taste for horticulture among the children of the laboring classes," the Massachusetts Horticultural Society offered prizes for Window Gardening. The report of the Committee on this subject was significant: "Those who have watched this movement from the first, while cognizant of all the difficulties that lie in the way of all new departures, have been encouraged by the interest manifested and the good results shown. Letters from several gentlemen and ladies bear testimony to the happy influence already noticed." We are glad to know that the experiment has been repeated the present year and will be next year. Is it not worth while encouraging the 300,200 children of the State of Massachusetts to instruct themselves in so delightful a recreation? And may it not be hoped that the good seed sown will result in turning some few from the dull routine of a factory life, into the nobler occupation of tilling the soil and becoming producers.

The special features of the September exhibition held in conjunction with the meeting of the American Pomological Society, were the excellent display of foliage plants,—Crotons, Alocasias, Dracænas, Marantas, and the like, so arranged as to combine the harmonies of shading in the most thoroughly artistic manner,—the fine collection of tropical water lilies (ten different species,) all grown out of doors and crowned with the great *Victoria regia*, whose gigantic leaves attracted universal attention, and the historic orchid, the *Vanda Sanderiana*, whose value mounting up into the thousands, seemed to be in an inverse ratio to its beauty.

(It is, no doubt, very gratifying to be able to say that you have seen a two-thousand-dollar orchid, but you feel something like the man who, having completed the reading of Milton, thanked Heaven he should never have to do it again.)

The absence of that finest of the florist's flowers, the pansy, was very marked. Hardly any competitors appeared for the special prizes offered, and but a handful of flowers were to be seen anywhere.

An interesting exhibition in the fruit line was a basket of pears from the original Bartlett pear tree (that is, the first tree imported into this country), which stands in what was the garden of the late Enoch Bartlett, in Roxbury, but which is now in possession of the Little Sisters of the Poor. Another, was the instructive display from the Arnold Arboretum of native and foreign ornamental fall fruits of shrubs, together with which were some dozen varieties of the crab apple, illustrating its gradual development from fruit the size of a pea into the large crab apples of today.

With its accustomed liberality, the Horticultural Society offered special prizes, amounting to $500, for excellence in fruit at this exhibition.

The final exhibition, the Show of Chrysanthemums, was a fitting culmination to the work of the year. It is impossible in words to adequately express the wondrous beauty of the scene on looking down upon it from the gallery above. The wealth of color, shading into every tint of the rainbow was surprising, while matchless in their simplicity, rose the pure white forms of other varieties. Involuntarily, there came into the mind, the ancient myth of the marriage of the balmy West Wind with Flora and the consequent embroidering of the earth with flowers. "Ofttimes," she says, "have I desired to reckon the tints as they were arranged and I could not, for their multitude exceeded all numbers." But alas! how the poetry vanished into air before the stern reality of fact. "No marriage service," as Mr. Thorpe prettily puts it, "had been read over the union of these flowers by passing moth or butterfly," but the plain, prosaic, fine camel's hair brush, transferring the pollen from the stamens of the one flower to the pistils of the other, had brought about these wonderful results. Art had done away with nature's aids.

REPORT

OF THE

COMMITTEE ON PUBLICATION AND DISCUSSION,

FOR THE YEAR 1887.

It is the privilege of the Committee in submitting their report to state, and it may be equally gratifying to the Society to know, that the department of Publication and Discussion, is equally progressive with other departments of its work. The published parts of the TRANSACTIONS are of increased size, and the papers and discussions at the weekly meetings the past winter have treated of a variety of subjects relating to the theory and practice of horticulture. That they are well up with the progress of the age, and the advanced phases of the Society's work, is manifest.

The Committee hoped to obtain the best talent and experience, both within and outside of the Society, to treat of the several subjects announced in the printed programme for the winter meetings.

The Committee desire in behalf of the Society, to cordially thank not only its members, but especially those outside its membership, who have contributed to the interest by Papers, Reports, and Discussions during the past season. They are especially gratified to be able to add to the TRANSACTIONS the excellent portrait of our lamented Ex-President, Col. Wilder, which has been furnished by his family. The sketch of his life, suggested by President Walcott, and prepared by the Secretary, has met with general acceptance as reminding those who had long known him, and informing a younger generation, of his eminent services not only to this Society but to Horticulture and Pomology throughout our country.

The Committee have performed the duty again assigned to them of awarding the prizes for the best reports of the committees to award prizes for horticultural products, as follows:

They award the first prize of $10 to Charles N. Brackett for the Report of the Committee on Vegetables.

The Second Prize of $8 to Joseph H. Woodford for the Report of the Committee on Plants and Flowers.

The Third Prize of $6 to E. W. Wood for the Report of the Committee on Fruits.

O. B. HADWEN,
FRANCIS H. APPLETON,
WILLIAM H. HUNT,
} *Committee on Publication and Discussion.*

REPORT

OF THE

COMMITTEE ON THE LIBRARY,

FOR THE YEAR 1887.

The present year, like those which have gone before, has seen the library very much augmented and the available funds all expended. The list appended to this report will give the titles of accessions, and it is, therefore, not necessary to specify many of them here. It may be well, however, to call attention to the well-known naturalist, Robert Ridgway's "Nomenclature of Color." This book, which was written more especially for ornithologists, will probably be of use to those who desire to describe the colors of flowers or fruit with accuracy. The greatest care has been taken in the preparation of this work to select, for the standard colors, pigments which are likely to resist the action of time and exposure. How valuable a feature this is will be appreciated by those who remember the present state of the earlier colored plates, in which all hues have faded, and some of them, notably the more intense, such as crimson, scarlet, and orange, are now simply blotches of gray or black.

The Card Catalogue of Plates has increased at the usual rate; that is, many thousand cards have been written and a great number have been put into their proper places in the drawers. It is found, on arranging these, that there are very many duplicates; in these cases the several references are entered upon one card to save space, and the duplicate cards are put away for future use.

It will be necessary before a great while to make a new catalogue of the library. The Committee advise that this be on cards, thereby greatly increasing its efficiency and convenience, while greatly diminishing its cost. They do not, however, recommend that this be undertaken until a very considerable increase is made

in the accommodations for the books. We have utilized, as it seems to us, all available space in this room and the committee-room, except that in front of the door into the Superintendent's office; even the space for the swinging of the folding doors has been saved by putting the curtain in their place; yet all this is a trifle in comparison with our needs. The new cases will accommodate about one-fifth of the books that are not now properly arranged.

As no one now, probably, expects the Society to occupy the Public Garden, we urge it to resume its consideration of the plans for a gallery, long ago submitted to it. The increase in books and pamphlets is, at present, remarkably rapid, and it is very desirable that something be done at a very early day.

For the Committee,

W. E. ENDICOTT, *Chairman.*

LIBRARY ACCESSIONS.

Books Purchased.

Darlington, William, M. D. Florula Cestrica. An essay towards a Catalogue of the Phænogamous Plants, native and naturalized, growing in the vicinity of the borough of West Chester, in Chester County, Pennsylvania. With brief notices of their properties and uses, in medicine, rural economy, and the arts. To which is subjoined an Appendix of the Useful and Cultivated Plants of the same district. 8vo. pp. xv., 152. 3 colored plates. West Chester, 1826.

Millspaugh, Charles F., M. D. American Medicinal Plants: an illustrated and descriptive guide to the American plants used as Homœopathic Remedies. Fascicle 6, completing the work. 4to. 30 colored plates. New York and Philadelphia: 1887.

Lloyd, J. U. and C. G. Drugs and Medicines of North America. Vol. 2. Nos. 3 to 5. Large 8vo. pamphlets, pp. 67–162. Plates 35–40, figures 131–165. December, 1886, to June, 1887.

Meehan, Thomas. The Native Flowers and Ferns of the United States in their Botanical, Horticultural, and Popular Aspects. Vols. 1 and 2 of the New Series, being vols. 3 and 4 of the whole. Large square 8vo. pp. 196, 204. 96 colored plates. Boston: 1880.

Gray, Asa, M. D. Botanical Contributions, 1886. [From the Proceedings of the American Academy of Arts and Sciences, Vol. 21. Issued May 4, 1886.] 1. A Revision of the North American Ranunculi. pp. 363–378. 2. Sertum Chihuahuense. pp. 378–409. 3. Miscellanea. pp. 409–443. 8vo. pamphlet.

Watson, Sereno. Contributions to American Botany. X. [From the Proceedings of the American Academy of Arts and Sciences. Vol. 17. Issued August 10, 1882.] I. List of Plants from Southwestern Texas and Northern Mexico, collected chiefly by Dr. E. Palmer in 1879–80. pp. 316–361. II. Descriptions of New Species of Plants from our Western Territories. pp. 362–382. 8vo. pamphlet.

——— ——. Contributions to American Botany. XI. [From the Proceedings of the American Academy of Arts and Sciences. Vol. 18. Issued August 15, 1883.] I. List of Plants from Southwestern Texas and Northern Mexico, collected chiefly by Dr. E. Palmer in 1879–80. pp. 96–191. II. Gamopetalæ to Acotyledones. II. Descriptions of some New Western Species. pp. 191–196. 8vo. pamphlet.

Bailey, L. H., Jr. Contribution from the Herbarium of Harvard University. [From the Proceedings of the American Academy of Arts and Sciences. Vol. 22. Presented April 14, 1886.] A preliminary Synopsis of North American Carices; including those of Mexico, Central America, and Greenland, with the American bibliography of the genus. 8vo. pamphlet. pp. 59–157.

Hemsley, W. B. Biologia Centrali-Americana. Botany. Vol. 4. Parts 22 and 23. 4to. pp. 49–298. London: March and August, 1887.

Spruce, Richard, Ph. D., etc. Palmæ Amazonicæ, sive Enumeratio Plantarum in itinere suo per regiones Americæ æquatoriales lectarum. [Extract from the Journal of the Linnean Society; Botany; Vol. XI. pp. 65–183.] 8vo. pamphlet. [London: 1869.]

Berg, Albert. Physiognomy of Tropical Vegetation in South America: a series of views illustrating the Primeval Forests of the river Magdalena and in the Andes of New Grenada. Large folio. pp. 12. 14 plates. London: 1854.

Sowerby, John Edward. English Botany: or Coloured Figures of British Plants. Third edition, enlarged. Vol. 12, completing the work. Marsiliaceæ to Characeæ, and Index to the whole work. Large 8vo. pp. 332. Plates 1825–1922. London: 1886.

Stephenson, John, M. D., F. L. S., and James Morss Churchill, F. L. S. Medical Botany: The Medicinal Plants and Poisonous Vegetables of Great Britain. 4 vols. Large 8vo. 185 colored plates. London: 1831.

Loudon, Mrs. British Wild Flowers. 4to. pp. 311. 60 colored plates. London: 1849.

Hulme, F. Edward, F. L. S., F. S. A. Familiar Wild Flowers. Fourth Series. Small 8vo. pp. 160. 40 colored plates. London, Paris, and New York: 1887.

Hallier, Dr. Ernst. Flora von Deutschland, Lieferungen 192–204 in continuation. Small 8vo. Many colored plates. Gera-Untermhaus: 1886, 1887.

Willkomm, Maurice. Illustrationes Floræ Hispaniæ Insularumque Balearicum. Livraisons 12, 13, being parts 2 and 3, of Vol. 2. 4to. pp. 17–48. Colored plates 102–119. Stuttgart: 1887.

Webb, MM. P. Barker -, and Sabin Berthelot. Phytographia Canariensis. 5 vols. Large 4to. pp. 181, 218, 491, 479, 208. 286 plates. Folio atlas of 20 plates. Paris and London: 1836–1840.

Regel, E. Flora of Turkestan. Vol. 3. Part 3, in continuation. Astragaleæ, by A. Bunge. 4to. pp. 161–318. Berlin and Moscow: 1880.

Labillardière, Jacobus-Julianus. Novæ Hollandiæ Plantarum Specimen. 2 vols. Large 4to. pp. 112, 131. 265 plates. Paris: 1804.

Zuccarini, Dr. Jos. Gerh. Monographie der Amerikanischen Oxalisarten. 4to. pp. 1–60. Plates 1–6. [Aus den Denkschriften der k. b. Akademie der Wissenschaften besonders abgedruckt.] München: 1825. Nachtrag, 4to. pp. 181–276. Plates 7–9. München: 1831.

Maw, George, F. L. S., etc., etc. A Monograph of the Genus Crocus. With an Appendix on the etymology of the words Crocus and Saffron, by C. C. Lacaita, F. L. S., etc. Large 4to. pp. 326. xx, 10. 77 colored plates, map, and two charts, and many vignettes and other woodcuts. London: 1886.

Hildebrand, Dr. Friedrich. Die Lebensverhältnisse der Oxalisarten. Large 4to. pp. 150. 5 lithographic plates. Jena: 1884.

Boissier, E. Icones Euphorbiarum: avec des considerations sur la classification et la distribution geographique des plantes de ce genre. Folio. pp. 24. 120 plates. Paris: 1866.

Fingerhuth, A., M. D. Monographia Generis Capsici. 4to. pp. 32 and iv. 10 colored plates. Dusseldorpii: 1832.

Zuccarini, Dr. J. G. Über einige Pflanzen aus den Gattungen Agave und Fourcroya. 4to. pp. 661–679. Plates 48–51. Breslau und Bonn: 1833.

Jacobi, General G. A. von. Über den Agaveen. 4 parts. 8vo. [Jahresbericht der Schlesischen Gesellschaft für vaterlandische Cultur, Verhandlungen der Botanischen Section.] 1867–1871.

Candolle, Alphonse et Casimir de. Monographiæ Phanerogarum Prodromi nunc continuatio, nunc revisio. Vol. 3, Philydraceæ, by T. Caruel: Alismaceæ, Butomaceæ, Juncagineæ, by Marco Micheli; Commelinaceæ, by C. B. Clarke; Cucurbitaceæ, by Alfred Cogniaux. pp. 1009. 8 plates. Vol. 4, Burseraceæ and Anacardiaceæ, by Ad. Engler; Pontederiaceæ, by Hermanno, Comite de Sohns Laubach. pp. 573. 15 plates. Vol. 5, Part 1, Cyrtandreæ, by C. B. Clarke. pp. 303. 32 plates. Part 2, Ampelideæ, by J. E. Planchon. pp. 305–654. 3 vols. 8vo. Paris: 1881–1887.

Baillon, H., Professeur, etc. Histoire des Plantes. Monographie des Caryophyllacées, etc. Imp. 8vo. pp. 81–224. [In continuation of the 9th vol.] 145 woodcuts. Paris and London: 1887.

Tournefort, Joseph Pitton de. Institutiones Rei Herbariæ. 3 vols. 4to. Vol. 1, text, pp. 697. Vols. 2 and 3, 476 plates. Paris: 1700.

Lamarck, M., and J. M. L. Poiret. Encyclopédie Methodique Botanique. 13 vols. text, and 4 vols. of 900 plates. 4to. Paris: 1783–1817.

Trattinnick, Leopoldo. Thesaurus Botanicus. Small folio. pp. 14. 80 colored plates. Vienna: 1819.

Hayne, Friedrich Gottlob. Getreue Darstellung und Beschreibung der in der Arzneikunde gebräulichen Gewachse, wie auch solcher, welche mit ihnen verwechselt werden können. 4to. Part of Vol. 14. Plates 1–24. Berlin: 1805–1846.

Smith, James Edward. Spicilegium Botanicum. Supplementary to Icones Pictæ Plantarum Rariorum. 4to. pp. 22. 24 colored plates. London: 1792.

Hooker, Joseph Dalton. Icones Plantarum. Third Series. Vols. 6, 7. 8vo. Plates 1501–1700. London: 1886, 1887.

Linnean Society of London. Transactions. 2d series. Botany. Vol. 2. Parts 9–14. August, 1886, to July, 1887. 4to. pp. 209–326. Plates 27–59. London: 1886, 1887.

——— ——— — ———. Journal. Vol. 22. Nos. 148, 149. pp. 401–560. Plates 20, 21. Vol. 23. No. 152. pp. 161–240. Plates 5, 6. Vol. 24. Nos. 158–161. pp. 1–261. Plates 1–8. 8vo. London: 1886, 1887.

Royal Agricultural Society of England. Journal. 2d series. Vol. 22, part 2. No. 44. pp. 361–756. Vol. 23. pp. 741. London: 1886, 1887.

Breyne, Jakob. Exoticarum aliarumque minus cognitarum plantarum. Centuria prima. Folio. pp. 195. 101 plates. With an Appendix, pp. i–vi, and De frutice thee et fasciculus rariorum plantarum, by Wilhelm tem Rhyne, pp. vii–xxv. Gedani: 1687.

Goebel, Dr. K. Outlines of Classification and Special Morphology of Plants: a new edition of Sach's Textbook of Botany, Book II. Authorized English Translation by Henry E. F. Garnsey, M. A., etc. Revised by Isaac Bayley Balfour, M. A., M. D., F. L. S., etc. Large 8vo. pp. 515. 407 woodcuts. Oxford: 1887.

Bastin, Edson S., A. M., etc. Elements of Botany, including Organography, Vegetable Histology, Vegetable Physiology, and Vegetable Taxonomy, and a Glossary of Botanical Terms. 8vo. pp. 282. 459 woodcuts. Chicago: 1887.

Strasburger, E., and W. Hillhouse. Handbook of Practical Botany: for the Botanical Laboratory and Private Student. 8vo. pp. 425. 134 woodcuts. London: 1887.

Sachs, Julius von. Lectures on the Physiology of Plants. Translated by H. Marshall Ward, M. A., F. L. S., etc. Large 8vo. pp. 836 455 woodcuts. Oxford: 1887.

Focke, Wilhelm Olbers. Die Pflanzen-Mischlinge: ein beitrag zur biologie der Gewächse. 8vo. pp. 569. Berlin: 1881.

Tupper, James Perchard. An Essay on the Probability of Sensation in Vegetables; with Additional Observations on Instinct, Sensation, Irritability, etc. Small 8vo. pp. 126. London: 1811.

McAlpine, Prof. D. Life Histories of Plants. Small square 8vo. pp. 296. 109 woodcuts; 58 diagrams. London: n. d.

Darwin, Charles, M. A., F. R. S. The Different Forms of Flowers on Plants of the same species. 8vo. pp. 352. 15 woodcuts. London: 1887.

Lindley, John. Observations on the Structure of Fruits and Seeds. Translated from the Analyse du Fruit of M. Louis-Claude Richard; with plates and original notes by Prof. Lindley. 8vo. pp. xx and 100. 6 plates. London: 1819.

Mohl, Dr. Heinrich. Morphologische Untersuchungen über die Eiche. 4to. pamphlet. pp. 35. 3 plates. Cassel: 1862.

Murray, Andrew. Floral Homologies of Conifers. Two pamphlets. 8vo. pp. 10 with 1 plate, and pp. 3. [From the Annals and Magazine of Natural History, for September and October, 1866.] London.

Goeppert, Heinrichus Robertus, Professor, etc. De Coniferarum structura anatomica. 4to. pamphlet. pp. 36. 2 plates. Vratislaviæ: 1841.

Hooker, Sir J. D. Botany. [Science Primer Series.] 3d edition. 16mo pp. 143. 72 woodcuts. London and New York: 1886.

Caddy, Mrs. Florence. Through the Fields with Linnæus: a chapter in Swedish History. 2 vols. 8vo. pp. 346, 376. 6 woodcuts and 2 maps. Boston and London: 1886.

Britten, James, F. L. S., and Robert Holland. A Dictionary of English Plant-Names. Part 3, completing the work. 8vo. pp. xxviii, 365–618. London: 1886.

American Journal of Science [Silliman's Journal]. Edited by James D. and Edward S. Dana. Vols. 115–134 inclusive, in continuation. 20 vols. 8vo. Plates. Hartford, Conn.: 1878–87.

Todaro, Dr. Augustino. Hortus Botanicus Panormitanus: sive Plantæ novæ vel criticæ, quæ in Orto Botanico Panormitano coluntur, descriptae et iconibus illustratæ. Tomus 2. Fasc. 4, in continuation. Folio. pp. 25–32. Plates 31, 32. Panormi: 1887.

Sloane, Hans. Voyage to the Islands of Madera, Barbados, Nieves, S. Christophers, and Jamaica; with the natural history of the herbs and trees, four-footed beasts, fishes, birds, insects, reptiles, etc., of the last of those islands, etc. 2 vols. Folio. pp. cliv and 264; xviii, 499, and xi. 1 chart and 274 plates. London: 1707 and 1725.

Michaux, F. A. Travels to the West of the Alleghany Mountains, in the States of Ohio, Kentucky, and Tennessee, etc. Undertaken in the year 1802, under the auspices of His Excellency M. Chaptal, Minister of the Interior. 2d edition. 8vo. pp. 294. London: 1805.

Thompson, Sir C. Wyville, Kn't, F. R. S., etc. Report on the Scientific Results of the Voyage of H. M. S. Challenger, during the years 1873–1876. Botany, Vol. 2, Report on the Diatomaceæ. Large 4to. pp. 178. 30 plates. London, Edinburgh, and Dublin: 1886.

Wawra v. Fernsee, Dr. Heinrich Ritter. Itinera Principum S. Coburgi. Die Botanische Ausbeute, etc. Erster Theil. Large 4to. pp. 182. 39 plates, mostly colored. Wien: 1883.

Jackson, Benjamin Daydon. Vegetable Technology; a contribution towards a Bibliography of Economic Botany; with a comprehensive subject index. Square 8vo. pp. 355. London: 1882.

Christy, Thomas, F. L. S., etc. New Commercial Plants and Drugs. Nos. 9 and 10, 2 pamphlets. 8vo. pp. 73, 123. 2 plates, 2 woodcuts. London: 1886.

Switzer, Stephen. Iconographia Rustica: or, The Nobleman, Gentleman, and Gardener's Recreation, etc. 2d edition, enlarged. 3 vols. 8vo. Over 50 copperplates. London: 1742.

Nicholson, George. The Illustrated Dictionary of Gardening; a practical and scientific encyclopedia of Horticulture for gardeners and botanists. Vol 2, F to O. pp. 544. 811 woodcuts. Vol. 3, P to S. pp. 537. 564 woodcuts. 2 vols. 4to. New York: 1887.

Dodwell, E. S., and others. Gossip for the Garden, a handbook for the florist and suburban horticulturist. [A monthly magazine.] 8 vols. 12mo. London: 1856–1863.

Cobbett, William. The English Gardener. 12mo. pp. 405. 12 plates. London: 1845.

Henderson, Peter. Gardening for Profit. New and enlarged edition. 12mo. pp. 376. 137 woodcuts. New York: 1887.

Fuller, Andrew S. The Propagation of Plants: giving the principles, etc. 12mo. pp. 349. 113 woodcuts. New York: 1887.

Abercrombie, John. The Hot-House Gardener. 8vo. pp. 238. 5 plates. London: 1789.

May, W. J. Greenhouse Management for Amateurs. 8vo. pp. 226. 13 woodcuts. London: n. d. [1887?]

Caledonian Horticultural Society. Memoirs of the. 4 vols. 8vo. 31 plates. Edinburgh: 1818–1829.

Webb, James. Cape Cod Cranberries. 12mo. pamphlet. pp. 41. Frontispiece. 17 woodcuts. New York: 1886.

Black, John J. The Cultivation of the Peach and the Pear on the Delaware and Chesapeake Peninsula. With a chapter on Quince culture and the culture of some of the Nut bearing trees. Small sq. 8vo. pp. 397. 8 plates. New York: 1887.

Harcourt, Helen. Florida Fruits and How to Raise Them. Revised and enlarged edition. Small 8vo. pp. 347. Louisville, Ky.: 1886.

Bernard, Mrs. Bayle. Our Common Fruits: a descriptive account of those ordinarily cultivated or consumed in Great Britain. 16mo. pp. 294. 6 colored plates. London: 1866.

Grindon, Leo. H. Fruits and Fruit Trees, Home and Foreign. Small 8vo. pp. 320. Frontispiece. Manchester, England: 1885.

Deutsche Obstsorten. Herausgegeben von einem Vereine Pomologen. 5 vols. Small 4to. 302 colored plates. Jena: n. d.

Thomson, David. A Practical Treatise on the Culture of the Pine Apple. 8vo. pp. 53. 8 woodcuts. Edinburgh and London: 1866.

Arnold, Edwin Lester. Coffee: its Cultivation and Profit. 8vo. pp. 270. 5 woodcuts. London: 1886.

Marshall, Henry, Deputy Inspector-General of Army Hospitals. Contribution to a Natural and Economical History of the Coco-Nut Tree. 8vo. pamphlet. pp. 32. Edinburgh: 1836.

Bonavia, E., M. D. The Future of the Date Palm in India. (Phœnix dactylifera.) 12mo. pp. 118. Calcutta: 1885.

Henderson, Peter. Practical Floriculture: a guide to the successful cultivation of florists' plants: for the Amateur and Professional Florist. New and enlarged edition. Large 12mo. pp. 325. 58 woodcuts. New York: 1887.

Anders, J. M., M. D., Ph. D., etc. House-Plants as Sanitary Agents; or, the relation of growing vegetation to health and disease. Large 12mo. pp. 334. Philadelphia: 1887.

Hibberd, Shirley. The Garden Oracle, and Illustrated Floricultural Year-Book for 1887. 29th year. Small 8vo. pp. 168. Woodcuts. London: 1886.

Hulme, F. Edward, F. L. S., F. S. A. Familiar Garden Flowers. 3d, 4th, and 5th series. 3 vols. Small 8vo. 120 colored plates. London, Paris, and New York: 1887.

Catlow, Agnes. Popular Greenhouse Botany, containing a Familiar and Technical Description of a selection of the Exotic Plants introduced into the Greenhouse. Square 16mo. pp. 311. 20 colored plates. London: 1857.

Allnutt, H. Our Flower Garden: how we made the most of it, etc. 2d edition. 16mo. pp. 91. London: n. d.

Heath, Francis George. My Garden Wild, and What I Grew There. Small 8vo. pp. 291. London: 1881.

Higgins, Rev. H. H. On a systematically arranged Border for Plants. 8vo. pamphlet, pp. 75–83. [Extract: published 1859].

Richardson, David Lester. Principal of the Hindu Metropolitan College, etc. Flowers and Flower Gardens: with an Appendix of practical instructions and useful information respecting the Anglo-Indian Flower Garden. 8vo. pp. 232 and xxxii. Calcutta: 1855.

Barla, J. - B. Chevalier, etc Flore Illustrée de Nice et des Alpes-maritimes. Iconographie des Orchidées. Large 4to. pp. 83. 63 colored lithographic plates. Nice: 1868.

Sanders, F. Reichenbachia. Orchids Illustrated and Described. Parts 1–10. Large folio. pp. 90. 40 plates. St. Albans, London, and Berlin: 1886, 1887.

Lindenia, Iconographie des Orchidées. Vol. 2, Nos. 5–12. Vol. 3, Nos. 1–3. Folio. 40 colored plates. Gand: 1887.

Warner, Williams, and Moore. Orchid Album. Vol. 6, Nos. 66–72. Vol. 7, Nos. 73–76. 4to. 52 colored plates. London: 1887.

Veitch, James & Sons. Manual of Orchidaceous Plants cultivated under glass in Great Britain. Part I. Odontoglossum. pp. 80. 2 maps. Plates and cuts. Part II. Cattleya, Lælia, etc. pp. 108. 3 maps. Plates and cuts. Two pamphlets, 8vo. Chelsea, England: 1887.

Britten, James, F. L. S., and W. H. Gower. Orchids for Amateurs. 8vo. pp. 236. Many woodcuts. London: n. d. [1887?]

D'Ombrain, Rev. H. Honywood. The Rosarian's Year-Book for 1887. Small square 8vo. pp. 83. 4 woodcuts and portrait of Mr. George Prince. London: 1887.

Lamborn, Leeroy L. Carnation Culture. Its classification, history, propagation, varieties, care, culture, etc. 12mo. pp. 151. 9 woodcuts. Alliance, Ohio: 1887.

Ghys, M. B., Pharmacien. Essai sur le Chrysanthème, comprenant son histoire, sa classification, ses differents types, sa culture détaillée, et la description des 400 plus belles variétés. 8vo. pamphlet. pp. 32. 3 cuts. Anzin: 1885.

Jannoch, T. Lilies of the Valley, Practical Hints on the Cultivation of. 16mo. pamphlet. pp. 10. 2 woodcuts. King's Lynn, England: 1881.

Brill, Francis. Cauliflowers, and how to grow them. 8vo. pamphlet. pp. 16. Woodcut. Riverhead, N. Y.: 1886.

Moore, Thomas. Theory and Practice applied to the Cultivation of the Cucumber in the Winter Season; to which is added a chapter on Melons. 12mo pamphlet. pp. 60. 1 woodcut. London: 1844.

May, W. J. Mushroom Culture for Amateurs: with full directions for successful growth in houses, sheds, cellars, and pots, on shelves, and out-of-doors. Small 8vo pamphlet. pp. 47. 1 plate and 11 woodcuts. London: n. d. [1887?]

Hazlitt, W. Carew. Gleanings in Old Garden Literature. 16mo. pp. 263. New York: 1887.

Covent Garden Gazette, Nos. 1–3, 5, 6, and 8. [Towards completing the set.] Also title page of Vol. 8, and index. Small folio. London: 1885.

Chambers, Dr. William, Comptroller-General of His Majesty's Works, etc. A Dissertation on Oriental Gardening. 2d Edition with Additions. To which is annexed an explanatory discourse, by Tan Chet-qua of Quang-chew-fu, Gent. 4to. pp. 163. London: 1773.

Gilpin, William, A. M., etc. Remarks on Forest Scenery, and other woodland views relative chiefly to picturesque beauty, illustrated by the scenes of New Forest in Hampshire. 3d edition, 2 vols. 8vo. pp. 344, 362. 32 plates. London: 1808.

Papworth, John Buonarotti. Hints on Ornamental Gardening. Imp. 8vo. pp. 112. 28 colored plates. London: 1823.

Cole, Nathan. The Royal Parks and Gardens of London: their history and mode of embellishment, etc. 8vo. pp. 131. Many woodcuts and geometrical designs. London: 1877.

Grigor, James. The Eastern Arboretum: or Rural Register of all the remarkable Trees, Seats, Gardens, etc., in the County of Norfolk. 50 portraits of trees by H. Ninham. 8vo. pp. 371. London: 1840, 1841.

Boulger, G. S., F. L. S., F. G. S. Familiar Trees. First Series. Small 8vo. pp. 160. 40 colored plates. London, Paris, New York, and Melbourne: 1887.

West, J. Remarks on the Management of Woods, Plantations, and Hedge-Row Timber. 8vo. pp. 128. Newark, England: 1842.

Roberts, Mary. Voices from the Woodlands: descriptive of Forest Trees, Ferns, Mosses, and Lichens. Square 16mo. pp. 311. 20 colored plates. London: 1850.

Knight & Perry. Synopsis of the Coniferous Plants grown in Great Britain and sold by them. 8vo. pp. 64. Frontispiece. London: n. d. [1850.]

Saint-Hilaire, M. Jaume. Traité des Arbres Forestiers: précédé d'une instruction, sur la culture des arbres, par M. Thouin. Royal 8vo. 90 colored plates. Paris: 1824.

—— —— — ——. Traité des Arbrisseaux et des Arbustes cultivées en France et en plein terre: précédé d'une instruction sur la culture des arbres et des arbrisseaux, par M. Thouin. 2 vols. Royal 8vo. 176 colored plates. Paris: 1825.

Moloney, Alfred, C. M. G., etc. Sketch of the Forestry of West Africa, with particular reference to its present principal commercial products. Small 8vo. pp. 533. London: 1887.

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New England Agricultural Society. Twenty-fourth Annual Fair, August 30 and 31 and September 1 and 2. List of Officers, Regulations, Premiums offered, etc. 8vo. pamphlet. pp. 39. Worcester: 1887. Extra copies for distribution. Edmund Hersey.

Massachusetts Board of Agriculture. Thirty-fourth Annual Report of the Secretary, with returns of the finances of the Agricultural Societies for the year 1886. 8vo. pp. 547. 8 plates. Boston: 1887. John E. Russell, Secretary. 50 copies.

Agricultural Meeting, held in Boston, January 13, 1840. Report and Notes by Henry Colman, Commissioner for the Agricultural Survey of the State. Containing the Remarks on that occasion of the Hon. Daniel Webster of the U. S. Senate, and of Professor Silliman, M. D., LL.D., of Yale College, Connecticut. 8vo. pamphlet. pp. 44. Salem: 1840. 2 copies. John C. Hovey.

Essex Agricultural Society. Transactions for the year 1886; with the 64th Annual Address and Premium List for 1887. 8vo. pamphlet. pp. 231. Gloucester: 1886. David W. Low, Secretary.

Amesbury and Salisbury Agricultural and Horticultural Society. Transactions for the year 1886; with the Secretary's Report of the Twenty-third Annual Fair, held at Amesbury, October 5 and 6, 1886. 8vo. pamphlet. pp. 32. Amesbury, Mass: 1886. The Society.

Marshfield Agricultural and Horticultural Society. Transactions for 1886, with the List of the Premiums for 1887. 8vo. pamphlet. pp. 48 and 20. Plymouth: 1887. F. Collamore, Secretary.

Maine Board of Agriculture. Thirtieth Annual Report of the Secretary for the year 1886–87. pp. 396. With an Appendix containing the Annual Report of the State Pomological Society, and selected papers etc. pp. 191. 2 plates. 8vo. Augusta: 1887. Z. A. Gilbert, Secretary.

Franklin County Agricultural Society. Transactions for the year 1886. 8vo. pamphlet. pp. 44. Greenfield: 1886. The Society.

Hampden County Agricultural Society. Programme of Horse and Cattle Show, and Fair, at Holyoke, Mass., September 21 and 22, 1887. 8vo. pamphlet. pp. 8. 1887.

Hampden Agricultural Society. Forty-second Annual Report, for the year ending December 15, 1886. 8vo. pamphlet. pp. 20. Springfield: 1887. J. N. Bagg, Secretary.

Highland Agricultural Society. Transactions for 1886; with Constitution, By-laws, etc. Also Lists of Officers, Premiums offered, etc., for 1887. 8vo. pamphlet. pp. 50. Springfield, Mass.: 1887. The Society.

Berkshire Agricultural Society. Transactions for 1886; with the Premium List for 1887. 8vo. pamphlet. pp. 44 and 24. Pittsfield: 1886. William H. Murray, Secretary.

Hoosac Valley Agricultural Society. Twenty-sixth Annual Report. Transactions for the year 1886. 8vo. pamphlet. pp. 69. North Adams: 1887. H. Clay Bliss, Secretary.

Nantucket Agricultural Society. Transactions for 1886 and 1887 together with the Lists of Premiums offered for 1887 and 1888. 2 pamphlets 8vo. pp. 43 and 40. Nantucket: 1886, 1887. The Society.

Housatonic Agricultural Society. Transactions. 1886. 8vo. pamphlet. pp. 56. Great Barrington: 1886. The Society.

Agriculture of Pennsylvania. Containing Reports of the State Board of Agriculture (pp. 326), the State Agricultural Society (pp. 172), the State Dairymen's Association (pp. 51), the State Horticultural Association (pp. 92), and the State College (pp. 20), for 1886. 1 vol. 8vo. Colored and plain plates and woodcuts. Harrisburg: 1887. Thomas J. Edge, Secretary of State Board of Agriculture. Also extra copies for distribution.

Virginia Department of Agriculture. Ninth Annual Report of the Commissioner of Agriculture. 8vo. pp. 92 and 63. Richmond: 1887. Also Reports for January, April, May, July, and September, 1887, on Crops, etc. 4 pamphlets 8vo. and broadside. Richmond: 1887. Randolph Harrison, Commissioner.

Georgia Department of Agriculture. Circulars, Nos. 87–96, on Analyses and Valuations of Commercial Fertilizers, etc. 10 pamphlets 8vo. Atlanta: 1887. J. T. Henderson, Commissioner.

International Association of Fairs and Expositions. Report of the Fourth Annual Convention, held at Chicago, Ill., December 15 and 16, 1886. 8vo. pamphlet. pp. 62. St. Louis: 1887. Festus J. Wade, Secretary.

Iowa Agricultural Society. Report of the Board of Directors for the year 1886. 8vo. pp. 653. Des Moines: 1887. John R. Shaffer, Secretary.

Nebraska State Board of Agriculture and State Horticultural Society. Annual Report for 1884. Two pamphlets in one. 8vo. pp. 206 and 91. Lincoln: 1886. Daniel H. Wheeler.

Sociedad Rural Argentina. Anales, 1887. 24 numbers, large 8vo. Buenos Aires: 1887. The Society.

Asociacion del Uruguay. Vol. 16, 1887. 24 numbers, large 8vo. Montevideo: 1887. The Society.

Potter, J. S. U. S. Consul at Crefeld. Report on Agriculture in Germany and subjects connected therewith. 8vo. pamphlet. pp. 23. Washington: 1887. The Secretary of State.

Maine State College of Agriculture and the Mechanic Arts, Orono. Annual Report of the Trustees and Faculty, 1886. 8vo. pamphlet. pp. 56. Frontispiece. Augusta: 1886. M. C. Fernald, President.

Massachusetts Agricultural College. Twenty-fourth Annual Report. January, 1887. 8vo. pamphlet. pp. 78. H. H. Goodell. President.

Commemorative Addresses delivered at the Massachusetts Agricultural College, June 21, 1887, on the Twenty-fifth Anniversary of the passage of the Morrill Land Grant Act. 8vo. pamphlet. pp. 61. Amherst, Mass.: 1887.

Purdue University School of Agriculture, Lafayette, Ind. Bulletin No. 10. A Report of the Director of the Indiana State Horticultural Experiment Station. 8vo. pamphlet. pp. 8. Lafayette, Ind.: 1886.

Michigan Agricultural College. Bulletins 22–30, on Varieties of Apples, Plant Lice, Commercial Fertilizers, Forest Products, [6 copies,] etc. 9 pamphlets 8vo. Lansing: 1887. Also Bulletin No. 31:

being the Annual Report of the Professor of Horticulture and Landscape Gardening to the President of the College, for the year 1887. Large 8vo. pamphlet. pp. 96. 13 woodcuts. Lansing: 1887. The College.

Joly, Ch. Note sur l'École d'Arboriculture et de Viticulture de Geisenheim. 8vo. pamphlet. pp. 11. Paris: 1887. The Author.

Massachusetts State Agricultural Experiment Station. Fourth Annual Report of the Board of Control for the year 1886. 8vo. pamphlet. pp. 136. Frontispiece and 2 plates. Boston: 1887. Also Bulletins 23–27, in continuation. C. A. Goessmann, Director, etc.

New York Agricultural Experiment Station. Bulletin No. 9. New Series. Was it Poison or Overfeeding? Small 8vo. pamphlet. pp. 3. Geneva, N. Y.: March 1, 1887. E. Lewis Sturtevant, M. D., Director.

——— ——— ——— ——— ———. Fifth Annual Report of the Board of Control; with the reports of the Director, etc. 8vo. pamphlet. pp. 398. Elmira, N. Y.: 1887. E. Lewis Sturtevant, M. D., Director.

Sturtevant, E. Lewis, Director New York Agricultural Experiment Station. Chat of a Station Director. 8vo. pamphlet. pp. 12. From Report of Connecticut Board of Agriculture for the year 1887. The Author.

New Jersey Agricultural Experiment Station. Seventh Annual Report for the year 1886. 8vo. pamphlet. pp. 215. Trenton: 1887. Also, Bulletin 41, January, 1887. Extraction of Sugar from Sorghum. Bulletin 42, September, 1887. Analyses and Valuations of Complete Fertilizers. Two pamphlets, 8vo. pp. 26, 21. Trenton: 1887. George H. Cook, Director.

University of Wisconsin Agricultural Experiment Station. Bulletin No. 11. On Wheat, Oats, Barley, Potatoes, and Corn, for 1886. 8vo. pamphlet. pp. 18. Madison: April, 1887. Fourth Annual Report for the year 1886. 8vo. pp. 196. 3 colored plates and 6 diagram sheets. Madison: 1887. Bulletin No. 12. The Oil Test for Cream. 8vo. pamphlet. pp. 15. Madison: October, 1887. Professor W. A. Henry, Director.

United States Department of Agriculture. Forestry Division. Bulletin No. 1. Report on the Relation of Railroads to Forest Supplies and Forestry: together with appendices on the Structure of some Timber Ties, their behavior and the cause of their decay in the roadbed: on Wood Preservation: on Metal Ties: and on the Use of Spark Arresters. 8vo. pamphlet. pp. 149. Many plates and woodcuts. Washington: 1887. The Commission. Annual Report for 1886, by B. E. Fernow, Chief of Division. 8vo. pamphlet. pp. 149–226 and 1 diagram sheet. Washington: 1887. The Author.

American Forestry Congress. Annual Meeting held in Springfield, Ill., commencing September 14, 1887. [Preliminary Newspaper Report.] 8vo. pamphlet. pp. 28. Springfield, 1887. B. E. Fernow, Secretary.

Gilson, F. H. Trees of Reading, Mass. Part I. 4to. 5 heliotype plates. Reading: 1887. The Author.

Arnold Arboretum. Annual Reports of the Director, to the President and Fellows of Harvard College, for the years 1884–85, 1885–86. 2 pamphlets 8vo. pp. 7 and 8. Cambridge: 1886, 1887. Charles S. Sargent, Director.

New York State Forest Commission. Reports for the years 1885 and 1886. 2 vols. 8vo. pp. 362 (with map), and 177. Albany: 1886, 1887. Abner L. Train, Secretary.

Forestry in Europe. Reports from the Consuls of the United States. 8vo. pamphlet. pp. 315. 8 plates. Washington: 1887. 2 copies. Hon. Thomas F. Bayard, Secretary of State.

Annuaire des Eaux et Forêts. 26e Année. 1887. 16mo. pp. 436. Paris: 1887. Publisher of the Revue des Eaux et Forêts.

Boston Parks Commissioners. Twelfth Annual Report. [Document 24; 1887.] For the year 1886. 8vo. pamphlet. pp. 29. Boston: 1887. The City of Boston.

Boston Common and Public Grounds. Superintendent's Annual Report for 1886. [Document 41; 1887.] 8vo. pamphlet. pp. 47. 4 plates. Boston: 1887. The City of Boston.

Worcester Parks-Commission. Annual Report for the year ending November 30, 1886. 8vo. pamphlet. pp. 40. Worcester, Mass.: 1887. Edward Winslow Lincoln, Chairman.

Brooklyn Park Commissioners. Twenty-Fifth Annual Report for 1885. 8vo. pp. 85. 6 photographic views. Brooklyn, N. Y.: 1886. Edward H. Brundage.

Baltimore Park Commission. Twenty-Seventh Annual Report, for the fiscal year ending December 31, 1886. 8vo. pamphlet. pp. 50. Baltimore: 1887.

Chicago South Park Commissioners. Reports to the Board of Commissioners of Cook County for the years 1884, 1885, and 1886. 3 pamphlets. 8vo. pp. 43 (with 1 plate), 36, and 36. Chicago: 1884–1886. H. W. Harmon, Secretary.

Mount Auburn Cemetery. Annual Report of the Trustees; with the Reports of the Treasurer and Superintendent. January, 1887. 8vo. pamphlet. pp. 16. Boston: 1887. The Corporation.

Forest Hills Cemetery. Annual Report of the Trustees, February, 1887. 8vo. pamphlet. pp. 33. Boston: 1887. John G. Barker, Superintendent.

United States Department of Agriculture. Division of Entomology. Bulletin No. 10, by C. V. Riley. Our Shade Trees, and their Insect Defoliators. pp. 69. 27 woodcuts. No. 12, prepared by the Entomologist. Miscellaneous (Supplementary) Notes on the Work of the Division for the year 1885. With a paper on the Periodical Cicada, by Amos W. Butler. pp. 46. 1 plate. No. 13. Reports of Observations and Experiments in the practical work of the Division, made under the direction of the Entomologist. pp. 78. No.

14. Observations and Experiments. No. 15. The Icerya or Fluted Scale. No. 16. The Entomological Writings of Dr. A. S. Packard. 6 pamphlets. 8vo. Washington, 1886, 1887. The Commissioner.

Riley, Charles V., M. A., Ph. D. Report of the Entomologist; from the Annual Report of the Department of Agriculture for the year 1886. 8vo. pamphlet. pp. v, 459–592, and ix. 11 plates (1 colored). Author's Edition. Washington: 1887. The Author.

Ontario Entomological Society. Seventeenth Annual Report. 8vo. pamphlet. pp. 64. 45 woodcuts. Toronto: 1887. Edmund Baynes Reed, Secretary-Treasurer.

Illinois State Laboratory of Natural History. Vol. 2, Article 2, and Vol. 3, Articles 1–3. 6 pamphlets. 8vo. Containing articles on the Parasitic Fungi of Illinois, by Professor T. J. Burrill and F. S. Earle; on the Parasites of the Lesser Apple Leaf-roller, Teras minuta, by Clarence M. Weed, and other subjects in Natural History. Peoria: 1886, 1887. Professor S. A. Forbes, Director.

Illinois State Entomologist's Office. Bulletins. No. 1. Arsenical Poisons for the Codling Moth. pp. 24. 11 diagrams. No. 2. On the Chinch Bug in Illinois. pp. 27–43. No. 3. Contribution to a Knowledge of the Life History of the Hessian Fly. pp. 45 to 61. 3 pamphlets. 8vo. By S. A. Forbes, Ph. D., State Entomologist. Springfield and Champaign: 1887.

Joly, Ch. Note sur le Concours International tenu a Florence, relativement aux appareils a projetir les insecticides. 8vo. pamphlet. pp. 4. Paris: 1887. The Author.

Remilly, Eugène. Le Sulphure de Carbone; son influence sur les animaux. 12mo. pamphlet. pp. 12. Versailles: 1887. Ch. Joly.

Ottawa Field Naturalists' Club. Transactions. Vol. 2, No. 3. 8vo. pamphlet. pp. 285–373. Ottawa, Canada: 1887. T. J. McLaughlin, Librarian.

Ottawa Naturalist. Vol. 1. Nos. 1–9. April to December, 1887. 9 pamphlets. 8vo. Ottawa, Canada. The Ottawa Field Naturalists' Club.

Smithsonian Institution. Annual Report of the Board of Regents for the year ending July, 1885. Part I. 8vo. pp. 996. Washington: 1886. The Institution. Also, the Annual Report for the year 1857. 8vo. pp. 438. Many woodcuts. S. L. Boardman.

Boston Society of Natural History. Memoirs. Vol. 3, Nos. 6–13. April, 1883, to September, 1886. [In continuation.] 8 pamphlets. 4to. Plates 37–48. The Society.

Clark, Hubert L. The Birds of Amherst and Vicinity, including nearly the whole of Hampshire County, Mass. With an Introduction by Professor C. H. Fernald, Ph. D. 8vo. pamphlet. pp. 55. Amherst, Mass.: 1887. H. H. Goodell.

Brookville Society of Natural History. Bulletin No. 2. A. W. Butler and A. N. Crecraft, Editors. 8vo. pamphlet. pp. 52. Richmond, Ind.: 1886. The Society.

New York Microscopical Society. Journal. Vol. 2, Nos. 8, 9, 9a; Vol. 3, Nos. 1–4. November, 1886, to October, 1887, inclusive. 7 numbers. 8vo. 3 plates. New York. The Society.

Massachusetts Institute of Technology. President's Report, December 8, 1886. 8vo. pamphlet. pp. 32. Boston: 1886. Twenty-second and Twenty-third Annual Catalogues, for the years 1886–87 and 1887–88. 2 pamphlets. 8vo. pp. 162 and 164. Boston: 1886, 1887. The Institute.

University of Illinois. Catalogue and Circular for the year 1886–87. Small 8vo. pamphlet. pp. 98. Champaign: 1887. Professor T. J. Burrill, Corresponding Secretary.

Illinois Industrial University. Thirteenth Report of the Board of Trustees, for the two years ending September 30, 1886. 8vo. pp. 305. Frontispiece. Springfield: 1887. Professor T. J. Burrill, Corresponding Secretary.

Bowdoin College. Eighty-sixth Annual Catalogue, for the academical year 1887–88. 8vo. pamphlet. pp. 60. Brunswick, Maine: 1887. William De Witt Hyde, D. D., President.

Leopoldina: Amtliches Organ der Kaiserlichen Leopoldino-Carolinischen Deutschen Akademie der Naturforscher. Einundzwanzigstes Heft. Jahrgang, 1885. 4to. pamphlet. pp. 216. Halle: 1885. Dr. C. H. Knoblauch.

United States Commissioner of Education. Report for the year 1884–85. 8vo. pp. 848. Washington: 1886. Circulars of Information, Nos. 1 and 2, 1886, and No. 2, 1887. 3 pamphlets. 8vo. pp. 78, 169, and 299, the last with 17 plates. Washington: 1886, 1887. N. H. R. Dawson, Commissioner.

Lawrence Free Public Library. Fifteenth Annual Report for the year 1886. 8vo. pamphlet. pp. 28. Lawrence, Mass.: 1887. Frederick H. Hedge, Jr., Librarian.

Astor Library. Thirty-eighth Annual Report of the Trustees, for the year 1886. 8vo. pamphlet. pp. 46. New York: 1887. The Trustees.

Library Company of Philadelphia. Bulletins. January and July–September, 1887, the latter the Constitutional Centennial Number. 2 pamphlets. 8vo. pp. 24, and 40 and xv.

New England Historic Genealogical Society. Proceedings at the Annual Meeting, January 5, 1887. 8vo. pamphlet. pp. 48. The Society.

Wisconsin State Historical Society. Thirty-fourth Annual Meeting, held January 6, 1887. 8vo. pamphlet. pp. 32. Madison: 1887. The Society.

Kansas State Historical Society. Fifth Biennial Report. 8vo. pamphlet. pp. 109. Topeka: 1887. Franklin G. Adams, Secretary.

Thorburn, Grant. Fifty Years' Reminiscences of New York, or Flowers from the Garden of Laurie Todd. Small 12mo. pp. 287. Portrait. New York: 1845. Charles L. Allen.

Flax and Hemp Spinners and Growers. Report of the Proceedings of the Convention of, held in Greenwich, N. Y., February 10, 1887, with

the Report of the Annual Meeting of the Flax and Hemp Spinners and Growers' Association. 8vo. pamphlet. pp. 40. Boston: 1887. A. R. Turner, Jr., President.

Knapp, Rev. Frederick Newman. Address, delivered at the Re-opening of the Town Hall at Walpole, N. H., February 10, 1887, with the other exercises of the occasion. 8vo. pamphlet. pp. 27. Keene, N. H.: 1887. The Author.

Harrison, J. B. The Latest Studies on Indian Reservations. Small 8vo: pamphlet. pp. 233. Philadelphia: 1887. The Author.

United States Consular Reports. Nos. 1, 2, 4, 5, 8, 9, 14, 16, 18, 19, 23, 25½, 53½, and 69–85. On the Commerce, Manufactures, etc. of the Consular Districts; Foreign Customs Duties; Emigration. etc. 30 pamphlets. 8vo. Also, Index to Consular Reports, Nos. 1–59. 8vo. pamphlet. pp. 213. Washington: 1880–1887. The Secretary of State.

Periodicals Purchased.

English. — Gardeners' Chronicle.
Gardeners' Magazine.
Journal of Horticulture and Cottage Gardener.
The Garden.
Gardening Illustrated.
Horticultural Times and Covent Garden Gazette.
Curtis's Botanical Magazine.
Journal of Botany.
Grevillea.

French. — Revue Horticole.
Revue des Eaux et Forêts.
Journal des Roses.

Belgian. — Illustration Horticole.
Revue de l'Horticulture Belge et Étrangère.

German. — Botanische Zeitung.

American. — Country Gentleman.
American Naturalist.
American Journal of Science.

Periodicals Received in Exchange.

Gartenflora.
Gardeners' Monthly.
Canadian Horticulturist.
American Garden.

Popular Gardening.
Vick's Illustrated Monthly Magazine.
Horticultural Art Journal.
American Florist.
Orchard and Garden.
Green's Fruit Grower.
Fruit and Grape Grower.
Seed-Time and Harvest.
Botanical Gazette.
Journal of Mycology.
West American Scientist.
Ottawa Naturalist.
Maine Farmer.
The Home Farm and Eastern Farmer.
Mirror and Farmer.
New England Farmer.
Massachusetts Ploughman.
American Cultivator.
New England Homestead.
Our Country Home.
American Agriculturist.
Rural New Yorker.
American Rural Home.
The Farm Journal.
Germantown Telegraph.
Maryland Farmer.
Florida Dispatch.
Prairie Farmer.
Student's Farm Journal.
The Industrialist.
Pacific Rural.
Boston Daily Advertiser.
Boston Morning Journal.
Boston Post.
Boston Daily Globe.
Boston Evening Transcript.
Boston Daily Evening Traveller.
New York Weekly World.
The Cottage Hearth.

REPORT

OF THE

SECRETARY AND LIBRARIAN,

FOR THE YEAR 1887.

As in past years, the keeping of various records, making reports of meetings and exhibitions, answering inquiries personally or by correspondence, and preparing the TRANSACTIONS and other publications for the press, have been the chief duties which I have been called on to perform as Secretary. It is obvious to anyone, upon the slightest reflection, that the last named of these various duties requires, that it may be performed in the shortest time and to the best advantage, such quiet and freedom from interruption that the labor shall be continuous, but I regret to say that the interruptions to this and work of similar character have never been so great as during the year now nearly closed. The same cause has also greatly lessened the suitableness of the Library Room as a place for the study of our books.

In my report for 1885, I spoke of the revision of the list of members, then in progress. This work was continued during the succeeding year and the results appeared in the second part of the TRANSACTIONS for that year. But after the most diligent inquiry there remained thirty-eight Life Members whom we were wholly unable to trace. These names were marked in the list of members with a dagger, and a more emphatic request than before was made for information concerning them, but only a single member responded to this request.

The unsuccessful attempt to secure a site for a building in the Public Garden for the use of the Society, necessarily added much to the work of the Secretary.

The increase in the library by the addition through donation and exchange of the reports of horticultural and agricultural societies, boards of agriculture, agricultural experiment stations, etc., remarked upon last year, still continues, and these publications form one of the most valuable departments of the library. Most of

them are American publications recording the results of practice or experiment under circumstances similar to those surrounding the members of our own Society, and therefore far more valuable than similar books from European sources. To be of the greatest value the series of these various reports should be perfect and unbroken, and to secure this it is necessary that every report as it comes to hand should be at once placed with those previously received, and at the same time examined to make sure that it is consecutive with them; but owing to the crowded state of our library we have in many instances been unable to secure this systematic order, but have been obliged to place the new arrivals wherever room could be found for them. As an indication of the rapid increase of books of this desirable class, I may mention that the record book of Library Accessions (other than those purchased from the Stickney Fund) which was begun in February, 1869, was filled in October, 1882, requiring a period of nearly sixteen years. Another book of the same size was then procured, which was filled at the end of the last month, a period of a little more than five years, showing that the additions to the library from the sources now under consideration during this second period have averaged fully three times as many as during the first period.

The removal of the heavy and cumbrous folding doors between the two rooms, and the substitution of a *portière*, has added much to our convenience, when it is desired to use the smaller apartment for the private meeting of a committee, and it has also improved the appearance of the room. Two new bookcases have lately been placed in the library, one of which exhausts all the space in the smaller room, and the other all that on the floor of the larger room, leaving as the only resource in these rooms, the construction of the gallery heretofore planned. The two new bookcases afford a slight but entirely inadequate relief, as they will hold but a very small part of the books which have long required better accommodation, and a part of the space afforded by them was immediately filled by some of the books comprised in our last importation from Europe, which had to wait until the completion of these bookcases because there was absolutely no room for them elsewhere. It cannot be doubted that it is the purpose of the Society to provide sufficient accommodation for the Library as soon as it sees its way clear to do so, but it should be understood that whenever this is done it will involve an almost entire re-arrangement of all the books,— a work of great magnitude and

one which increases with every day's delay. A card catalogue of the books is also exceedingly desirable, but it is hoped that the present catalogue may be made to answer until there shall be sufficient space for a systematic arrangement of the books, as otherwise much of the work would unavoidably require to be done over again.

Perhaps there is no library in our country containing so large a proportion as our own of costly illustrated books. The plates, often of high value as works of art, offer temptations which the experience of other libraries has shown, are not always resisted. The Library Committee, therefore, in 1865, adopted the measure of precaution commonly used in libraries, by procuring a stamp for the purpose of stamping every plate with the impress of the Society as soon as received. This was, however, kept up for less than a year, but the present Library Committee have now directed it to be resumed. It will make a permanent addition to the work of those having immediate charge of the library, but if it prevents the mutilation of valuable books the labor will be well bestowed.

The work of binding those books most needing it has been continued during the present year. The largest number of any one set which has thus been made convenient for use is forty volumes of the Journal of the National Horticultural Society of France. For the completion of this set our most grateful acknowledgements are due to Mons. E. Glatigny, the Librarian of that Society, whose painstaking kindness has been unwearied. With those previously bound it now consists of sixty-three volumes. There are but three sets of books in the library comprising as many volumes as this: viz., Curtis's Botanical Magazine, of 91 volumes; the Journal of Horticulture and Cottage Gardener, of 77 volumes; and the Gardener's Chronicle, of 63 volumes, the same number as the work under consideration. Twenty-five volumes (all thus far received) of the new edition of Hallier's Flora Von Deutschland, have also been bound. This work will be completed in four or five more volumes, and it is thought that when these are added our collection of books on the Botany of Central Europe, will be so full that further additions may for the present be suspended.

ROBERT MANNING,

Secretary and Librarian.

TREASURER'S REPORT,

FOR THE YEAR 1887.

RECEIPTS.

Cash on hand, January 1st, 1887,			$5,516 52
Rent of Halls,			7,834 51
Rent of Stores,			12,986 44
Admissions and Assessments,			930 00
Stickney Fund, Sale of Books,			7 50
Mount Auburn Cemetery,			3,096 09
Annual Exhibitions,	$3,277 85		
Less Expenses,	2,988 12		
			289 73
State Bounty,			600 00
Interest on Bonds,			208 89
" " Deposits,			75 17
" " the following Funds at 5 per cent. per annum:			

	Principal.	Interest.	
Samuel Appleton Fund,	$1,000 00	$50 00	
John A. Lowell "	1,000 00	50 00	
Theodore Lyman "	11,000 00	550 00	
Josiah Bradlee "	1,000 00	50 00	
Benjamin V. French "	500 00	25 00	
H. H. Hunnewell "	4,000 00	200 00	
William J. Walker "	2,354 13	117 72	
Levi Whitcomb "	500 00	25 00	
Benjamin B. Davis "	500 00	25 00	
			1,092 72
Josiah Stickney "	12,000 00		
Interest expended on Library,			679 97
M. B. Faxon, Special Prize Fund,			20 00
Estate of Marshall P. Wilder, for Prizes for Grapes and Pears,			1,000 00
			$34,287 54

EXPENDITURES.

Labor,	$1,557 75	
Salaries,	2,875 00	
Incidentals,	284 84	
Interest,	3,292 06	
Taxes,	2,412 00	
Repairs on Building,	161 97	
Heating, $569, and Water Tax, $71.85,	640 85	
Lighting,	851 71	
Furniture and Exhibition Ware,	498 46	
Prizes for 1886, $5,752.58; Window Gardening, $41.72,	5,794 30	
Committee of Arrangements,	225 70	
Committee on Publication and Discussion,	120 00	
Stationery, Printing, and Postage,	1,168 24	
Card Catalogue,	101 25	
Stickney Fund,	687 47	
Library,	300 00	
Legal Services,	50 00	
Sinking Fund,—C., B. & Q. Bonds, $5,000, 4%,—cost	4,925 00	
Kansas City and Springfield Bond, $1,000, cost	980 00	
Cash on hand, December 31st, 1887,	7,360 94	
		$34,287 54

ASSETS.

Real Estate,			$250,000 00
Furniture and Exhibition Ware,	1886, $6,585 56		
	Added, 1887, 498 46		
			7,084 02
Library,	1886, $25,646 12		
	Added, 1887, 987 47		
			26,633 59
Stereotype Plates and Copies of History,			299 50
Chicago, Burlington and Quincy Bonds,			1,500 00
Illinois Grand Trunk Bond,			500 00
Kansas City and Springfield Bond,			1,000 00
Chicago, Burlington and Quincy Bonds, $5,000,			4,925 00
Cash on hand December 31st, 1887,			7,360 94
			$299,303 05

LIABILITIES.

Mortgage on Building, . . .		$30,000 00	
Josiah Stickney Fund, payable to Harvard College in 1899, without interest,		12,000 00	
The following Prize Funds invested in Building:			
Samuel Appleton Fund,	$1,000 00		
John A. Lowell "	1,000 00		
Theodore Lyman "	11,000 00		
Benjamin V. French "	500 00		
Josiah Bradlee "	1,000 00		
William J. Walker "	2,354 48		
Levi Whitcomb "	500 00		
H. H. Hunnewell "	2,500 00		
		19,854 48	
The following Prize Funds invested in Bonds aforementioned:			
H. H. Hunnewell Fund,	$1,500 00		
Benjamin B. Davis "	500 00		
Marshall P. Wilder "	1,000 00		
		3,000 00	
Prizes for 1887 due and unpaid, . .		7,174 00	
			72,028 48
Surplus, ...			$227,274 57

MEMBERS.

Number of Life Members per last report, .	576	
Added during the year, ...	12	
Commuted from Annual, . . .	2	
	590	
Deceased during the year, or now first reported, ...	29	
		561
Annual Members per last report, . . .	256	
Added during the year, ...	15	
	271	

Deceased,		10	
Discontinued,		28	
Commuted to Life,		2	
		40	
			231
Total Membership,			792

INCOME FROM MEMBERSHIP.

12 Life Members,	$360 00	
15 Annual Members,	150 00	
190 Assessments,	380 00	
2 Commuted,	40 00	
Total Income from Members,		$930 00

The Finance Committee having audited the accounts of the undersigned, made and subscribed to on a book kept for that purpose, the following report:

The Massachusetts Horticultural Society

In account with GEORGE W. FOWLE, *Treasurer.*

Credit:—

By balance in treasury, December 31, 1886,	$5,516 52
" total income, as per cash book,	30,589 56
	$36,106 08

Debit:—

To cash paid, as per cash book,	$28,745 14
" balance to new account,	7,360 94
	$36,106 08

BOSTON, February 27, 1888.

We have examined the above account and find it correct, and the balance of cash on hand seventy-three hundred and sixty dollars and ninety-four cents, as stated.

H. H. HUNNEWELL,
FREDERICK L. AMES,
H. P. WALCOTT,
} *Finance Committee.*

The Finance Committee, on the 1st of January of this year, commenced a new system of book-keeping, which clearly shows the financial position of the Society, showing in detail the legacies and donations received by the Society, and giving proper credit to the generous donors, particulars of which will be found in the Treasurer's statement.

During the past year the sum of forty-nine hundred and twenty-five dollars has been invested in Railroad Bonds for the Sinking Fund, and one thousand dollars received from the estate of the late Marshall P. Wilder has been invested in a Railroad Bond.

GEORGE W. FOWLE,

Treasurer.

Dr. *Massachusetts Horticultural Society, in account with the Proprietors of the Cemetery of Mt. Auburn.* **Cr.**

For Sales and Improvements within the Cemetery for the year ending December 31, 1887.

To cost of filling up and improving land at Mt. Auburn for the year ending December 31, 1887; the Massachusetts Horticultural Society being charged with their proportion of the same:			
Glen Avenue,	$56 25		
Maple and Viburnum Avenues,	99 00		
Birch Avenue to Eagle and Cherry Avenues,	172 51		
	$327 76		
One-quarter of $327.76 is	$81 94		
Balance due Massachusetts Horticultural Society,	3,096 09		
		$3,178 03	
		$3,178 03	

By Sales in January,	$448 00	
" " " February,	800 00	
" " " March,	141 25	
" " " April,	1,800 00	
" " " May,	3,800 13	
" " " June,	1,800 75	
" " " July,	1,910 00	
" " " August,	800 00	
" " " September,	100 00	
" " " October,	800 00	
" " " November,	870 00	
" " " December,	400 00	
	$13,800 13	
Net amount received from Receiving Tomb,	800 00	
	$14,150 13	
Less graves repurchased,	40 00	
	$14,110 13	
Deduct for Annual Expenses,	1,400 00	
	$12,710 13	
Mass. Horticultural Society's one-fourth part of $12,710 13 is		$3,178 03

E. & O. E.

December 31, 1887.

H. H. MACKINTOSH, Treasurer

MASSACHUSETTS HORTICULTURAL SOCIETY,

To the PROPRIETORS OF THE CEMETERY OF MOUNT AUBURN, *Dr.*

For one-fourth part of the following expenditures for grading new lands for sale during the year 1887:

Glen Avenue.

25 days, men, ...	$56 25	
		$56 25

Maple and Viburnum Avenues.

44 days, men, ...	$99 00	
		$99 00

Birch Avenue to Eagle and Cherry Avenues.

7½ days, men, ...	$16 88	
41½ " man and horse, ...	155 63	
		$172 51
		$327 76
One-fourth part of $327.76 is		$81 94

J. W. LOVERING,
Superintendent.

MOUNT AUBURN, Dec. 31, 1887.

I certify the foregoing to be a true copy of improvements for the year 1887, rendered by the Superintendent.

H. B. MACKINTOSH,
Treasurer.

Massachusetts Horticultural Society.

OFFICERS AND STANDING COMMITTEES FOR 1888.

President.

HENRY P. WALCOTT, of Cambridge.

Vice-Presidents.

CHARLES H. B. BRECK, of Brighton. FREDERICK L. AMES, of North Easton.
BENJAMIN G. SMITH, of Cambridge. WILLIAM H. SPOONER, of Jamaica Plain.

Treasurer and Superintendent of the Building.

GEORGE W. FOWLE, of Boston.

Secretary and Librarian.

ROBERT MANNING, of Salem.*

Recording Secretary.

ROBERT MANNING, of Salem.

Professor of Botany and Vegetable Physiology.

JOHN ROBINSON, of Salem.

Professor of Entomology.

SAMUEL H. SCUDDER, of Cambridge.

Standing Committees.

Executive.

THE PRESIDENT, HENRY P. WALCOTT, CHAIRMAN.
THE CHAIRMAN OF THE FINANCE COMMITTEE, H. H. HUNNEWELL; WILLIAM C. STRONG, FREDERICK L. AMES, CHARLES H. B. BRECK, HENRY WELD FULLER, CHARLES S. SARGENT, WILLIAM H. SPOONER, EDWARD L. BEARD.

* Communications for the Secretary, on the business of the Society, should be addressed to him at Horticultural Hall, Boston

Finance.

H. HOLLIS HUNNEWELL, CHAIRMAN.

HENRY P. WALCOTT. FREDERICK L. AMES.

Publication and Discussion.

O. B. HADWEN, CHAIRMAN.

FRANCIS H. APPLETON. WILLIAM H. HUNT.

Establishing Prizes.

CHAIRMAN OF COMMITTEE ON FRUITS, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON PLANTS AND FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;* C. M. ATKINSON, EDWARD L. BEARD, JACKSON DAWSON.

Library.

WILLIAM E. ENDICOTT, CHAIRMAN.

THE PROFESSOR OF BOTANY AND VEGETABLE PHYSIOLOGY AND THE PROFESSOR OF ENTOMOLOGY, *EX OFFICIIS;*

J. D. W. FRENCH. NATHANIEL T. KIDDER.

FRANCIS H. APPLETON. GEORGE W. HUMPHREY.

Gardens.

JOHN G. BARKER, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FRUITS, PLANTS AND FLOWERS, AND VEGETABLES, *EX OFFICIIS;* CHARLES W. ROSS, HENRY W. WILSON, DAVID ALLAN.

Fruit.

E. W. WOOD, CHAIRMAN.

BENJAMIN G. SMITH.	J. W. MANNING.	WARREN FENNO.
CHARLES F. CURTIS.	O. B. HADWEN.	SAMUEL HARTWELL.

Plants and Flowers.

JOSEPH H. WOODFORD, CHAIRMAN.

F. L. HARRIS.	WARREN H. MANNING.	ARTHUR H. FEWKES.
W. A. MANDA.	MICHAEL H. NORTON.	WILLIAM J. STEWART.

Vegetables.

CHARLES N. BRACKETT, CHAIRMAN.

WARREN HEUSTIS.	CEPHAS H. BRACKETT.	P. G. HANSON.
VARNUM FROST.	JOHN C. HOVEY.	J. WILLARD HILL.

Committee of Arrangements.

EDWARD L. BEARD, CHAIRMAN.

CHAIRMEN OF COMMITTEES ON FRUITS, PLANTS AND FLOWERS, VEGETABLES, AND GARDENS, *EX OFFICIIS;*

PATRICK NORTON. ROBERT FARQUHAR.

MEMBERS FOR LIFE.

Members of the Society and all other persons who may know of deaths, changes in residence, or other circumstances showing that the following list is inaccurate in any particular will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to members whose names are marked thus †.

Adams, Luther, Brighton.
Albro, Charles, Taunton.
Alger, R. F., Becket.
Allan, David, Mount Auburn.
Ames, Frank M., Canton.
Ames, Frederick L., North Easton.
Ames, George, Boston,
Ames, Preston Adams, South Hingham.
Amory, Charles, Boston.
Amory, Frederick, Boston.
Anderson, Alexander, West Hingham.
Andrews, Charles L., Milton.
Andrews, Frank W., Boston.
Andros, Milton, San Francisco, Cal.
Appleton, Edward, Reading.
Appleton, Francis H., Peabody.
Appleton, William S., Boston.
Atkins, Elisha, Boston.
Augur, P. M., Middlefield, Conn.
Avery, Edward, Boston.
Ayling, Isaac, M. D., Waltham.

Bailey, Edwin C., West Stowe, Vt.
Baker, William E., Boston.
Bancroft, John C., Boston.
Banfield, Francis L., M.D., Worcester.
Barnard, James M., Malden.
Barnard, Robert M., Everett.
Barnes, Walter S., Somerville.
Barnes, William H., Boston.
†Barney, Levi C., Boston.
Barratt, James, Cambridgeport.
Barrett, Edwin S., Concord.
Bartlett, Edmund, Newburyport.
Bates, Amos, Hingham.
Bates, Caleb, Kingston.
Beal, Alexander, Dorchester.
Beal, Leander, Boston.
Beckford, Daniel R., Jr., Dedham.
Bell, Joseph H., Quincy.
Berry, James, Brookline.
Bickford, Weare D., Newtonville.
Birchard, Charles, Framingham.
Black, James W., Cambridge.
Blake, Arthur W., Brookline.
Blakemore, John E., Roslindale.
Blanchard, John W., Dorchester.
Blaney, Henry, Boston.
Blinn, Richard D., Chicago, Ill.
Bliss, William, Springfield.
Bocher, Prof. Ferdinand, Cambridge.
Bockus, Charles E., Dorchester.
Bond, George W., Jamaica Plain.
Borland, John N., M. D., New London, Conn.
Botume, John, Wyoming.
Bouvé, Thomas T., Boston.
Bowditch, Azell C., Somerville.
Bowditch, Charles P., Jamaica Plain.
Bowditch, J. Ingersoll, Jamaica Plain.
Bowditch, William E., Roxbury.
Bowker, William H., Boston.
Brackett, Cephas H., Brighton.
Brackett, Charles N., Newton.
Bradish, Levi J., Boston.

Bragg, Samuel A. B., Dorchester.
Bresee, Albert, Hubbardton, Vt.
Brewer, Francis W., Hingham.
Brewer, John Reed, Boston.
Brewer, Otis, West Roxbury.
Brigham, William T., Boston.
Brimmer, Martin, Boston.
Brintnall, Benjamin, Charlestown.
Brooks, Francis, West Medford.
Brown, Alfred S., Jamaica Plain.
Brown, Charles E., Yarmouth, N. S.
Brown, Edward J., Weston.
Brown, George Bruce, Framingham.
† Brown, G. Barnard, Boston.
Brown, Jacob, Woburn.
Brownell, E. S., Essex Junction, Vt.
† Bruce, Nathaniel F., Stoneham.
Bullard, John R., Dedham.
Bullard, William S., Boston.
Burnett, Joseph, Southborough.
Burnham, Thomas O. H. P., Boston.
Burr, Fearing, Hingham.
Burr, Matthew H., Hingham.
Buswell, Edwin W., New York, N. Y.
Buswell, Frank E., New York, N. Y.
† Butler, Aaron, Wakefield.
Butler, Edward K., Jamaica Plain.
Butterfield, William P., East Lexington.

Cabot, Edward C., Brookline.
Cadness, John, Flushing, N. Y.
Cains, William, South Boston.
Calder, Augustus P., Boston.
Capen, John, Boston.
Carlton, Samuel A., Boston.
Carruth, Charles, Boston.
Carter, Miss Sabra, Wilmington.
Cartwright, George, Dedham.
Chadbourne, Marshall W., Watertown.
Chamberlain, Chauncey W., Boston.
Chapin, Nathaniel G., Brookline.
Chapman, Edward, South Framingham.
Chase, Andrew J., Lynn.
Chase, Daniel E., Somerville.
Chase, George B., Boston.
Chase, Hezekiah S., Boston.
Chase, William M., Baltimore, Md.
Cheney, Benjamin P., Boston.
Child, Francis J., Cambridge.
Child, William C., Medford.
Childs, Francis, Charlestown.
Childs, Nathaniel R., Boston.
Choate, Charles F., Cambridge.
Claflin, Henry, Newton.
Claflin, William, Newton.
Clapp, Edward B., Dorchester.
Clapp, James H., Dorchester.
Clapp, William C., Dorchester.
Clark, Benjamin C., Boston.
Clark, Orus, Boston.
Clarke, Miss Cora H., Jamaica Plain.
Clay, Henry, Dorchester.
Cleary, Lawrence, West Roxbury.
Clement, Asa, Dracut.
Cleveland, Ira, Dedham.
Cobb, Albert A., Brookline.
Coburn, Isaac E., Everett.
Codman, James M., Brookline.
Codman, Ogden, Lincoln.
Coffin, G. Winthrop, West Roxbury.
Coffin, William E., Dorchester.
Collamore, Miss Helen, Boston.
Converse, Elisha S., Malden.
Converse, Parker L., Woburn.
Coolidge, Joshua, Watertown.
Copeland, Franklin, West Dedham.
Coy, Samuel I., Boston.
Crosby, George E., West Medford.
Crowell, Philander, Chelsea.
Crowell, Randall H., Chelsea.
Cummings, John, Woburn.
Curtis, Charles F., Jamaica Plain.
Curtis, George S., Jamaica Plain.
Cushing, Robert M., Boston.

† Daggett, Henry C., Boston.
Damon, Samuel G., Arlington.
Dana, Charles B., Wellesley.
Darling, Charles K., Boston.
Davenport, Edward, Dorchester.
Davenport, George E., Medford.

Davenport, Henry, Boston.
Dawson, Jackson, Jamaica Plain.
Deblois, Stephen G., Boston.
Dee, Thomas W., Mount Auburn.
Denny, Clarence H., Boston.
Denton, Eben, Dorchester.
Dewson, Francis A., Newtonville.
Dexter, F. Gordon, Boston.
Dickerman, George H., Somerville.
Dike, Charles C., Stoneham.
Dinsmore, William B., New York, N. Y.
Dorr, George, Dorchester.
Dove, George W.W., Andover.
Durant, William, Boston.
Durfee, Mrs. Fidelia B., Fall River.
Durfee, George B., Fall River.
Dutcher, F. J., Hopedale.

Eaton, Horace, Quincy.
Eldridge, Azariah, Yarmouthport.
†Eldridge, E. H., Roxbury.
Ellicott, Joseph P., Boston.
Elliott, Mrs. John W., Boston.
Endicott, William E., Canton.
Eustis, William C., Hyde Park.
Everett, William, Dorchester.

Fairchild, Charles, Belmont.
Falconer, William, Glencove, N.Y.
Farlow, John S., Newton.
Farlow, Lewis H., Newton.
Farquhar, Robert, Boston.
†Faxon, John, Quincy.
Fenno, J. Brooks, Boston.
Fewkes, Arthur H., Newton Highlands.
Fewkes, Edwin, Newton Highlands.
Fillebrown, John, Arlington.
Fisher, David, Newport, R.I.
Fisher, James, San Diego, Cal.
Fisher, Warren, Boston.
Flagg, Augustus, Boston.
Fleming, Edwin, West Newton.
Fletcher, George V., Belmont.
Fletcher, John W., Chelsea.
Fletcher, J. Henry, Belmont.
Flint, Charles L., Boston.
Flint, David B., Watertown.
Flynt, William N., Monson.
Forster, Edward J., M. D., Charlestown.
Foster, Francis C., Cambridge.
Fottler, John, Jr., Dorchester.
Fowle, George W., Jamaica Plain.
Fowle, William B., Auburndale.
Freeman, Abraham, Dorchester.
French, Jonathan, Boston.
French, J. D. Williams, Boston.
Fuller, Henry Weld, Roxbury.

Galvin, John, West Roxbury.
Gardner, Henry N., Belmont.
Gardner, John L., Brookline.
Gibbs, Wolcott, M.D., Newport, R. I.
Gillard, William, Atlantic.
Gilmore, E. W., North Easton.
Gilson, F. Howard, Reading.
Glover, Albert, Boston.
Glover, Joseph B., Boston.
Goddard, A. Warren, Brookline.
Goddard, Mrs. Mary T., Newton.
Goodell, L. W., Dwight.
Gorham, James L., Jamaica Plain.
†Gould, Samuel, Boston.
Gray, James, Wellesley.
Gregory, James J. H., Marblehead.
Greig, George, Toronto, Ontario.
Grey, Benjamin, Malden.
Groom, Thomas, Dorchester.
Grundel, Hermann, Dorchester.
Guild, J. Anson, Brookline.

Hadwen, Obadiah B., Worcester.
Hall, Edwin A., Cambridgeport.
Hall, George A., Chelsea.
Hall, George R., Fort George, Fla.
Hall, John R., Roxbury.
Hall, Lewis, Cambridge.
Hall, Stephen A., Revere.
Hall, William F., Brookline.
Halliday, William H., South Boston.
Hammond, Gardiner G., New London, Conn.

Hammond, Samuel, Boston.
Hanson, P. G., Woburn.
Harding, Charles L., Cambridge.
Harding, George W., Arlington.
Harding, Lewis B., Boston.
Harding, William C., Stamford, Ct.
Hardy, F. D., Jr., Cambridgeport.
Harrington, Leonard B., Salem.
Harrington, Nathan D., Somerville.
Harris, Charles, Cambridge.
Harris, Thaddeus William, A. M., Cambridge.
Hart, William T., Boston.
Hastings, Levi W., Brookline.
Hathaway, Seth W., Marblehead.
Haughton, James, Boston.
Hayes, Daniel F., Exeter, N. H.
Hayes, Mrs. Francis B., Senior, Lexington.
Hayes, Francis B., Lexington.
†Hazeltine, Hazen, Boston.
Head, Charles D., Brookline.
Henshaw, Joseph P. B., Boston.
Heywood, George, Concord.
Hilbourn, A. J., Boston.
Hill, George, Arlington.
Hill, John, Stoneham.
Hitchings, E. H., Malden.
Hittinger, Jacob, Belmont.
Hoar, Samuel, Concord.
Hodgkins, John E., Chelsea.
†Hollis, George W., Grantville.
Hollis, John W., Allston.
Holt, Mrs. Stephen A., Winchester.
Hooper, Thomas, Bridgewater.
Horner, Mrs. Charlotte N. S., Georgetown.
Hovey, Charles H., Cambridgeport.
Hovey, John C., Cambridgeport.
Hovey, Stillman S., Woburn.
Hubbard, Charles T., Weston.
Hubbard, Gardner G., Cambridge.
Hubbard, James C., Everett.
Humphrey, George W., Dedham.
Hunneman, Joseph H., Boston.
Hunnewell, Arthur, Wellesley.
Hunnewell, H. Hollis, Wellesley.
Hunnewell, Walter, Wellesley.
Hunt, Franklin, Boston.
Hunt, William H., Concord.
Hyde, James F. C., Newton Highlands.

Inches, Herman B., M. D., Boston.

Jackson, Abraham, Boston.
Jackson, Charles L., Cambridge.
Jackson, Robert T., Dorchester.
Janvrin, William S., Revere.
Jeffries, John, Boston.
Jenks, Charles W., Boston.
Johnson, J. Frank, Boston.
Joyce, Mrs. E. S., Medford.

Kakas, Edward, West Medford.
Kelly, George B., Jamaica Plain.
†Kendall, D. S., Woodstock, Ont.
Kendall, Edward, Cambridgeport.
Kendall, Joseph R., San Francisco, Cal.
Kendrick, Mrs. H. P., Allston.
Kennard, Charles W., Boston.
Kennedy, George G., M. D., Milton.
Kent, John, Charlestown.
†Keyes, E. W., Denver, Col.
Keyes, George, Concord.
Kidder, Nathaniel T., Milton.
†Kimball, A. P., Boston.
King, Franklin, Dorchester.
Kingman, Abner A., Brookline.
Kingman, C. D., Middleborough.
Kinney, John M., East Wareham.

Lancaster, Charles B., Newton.
Lane, John, East Bridgewater.
Lawrence, James, Groton.
Lawrence, John, Boston.
Lee, Charles J., Dorchester.
Lee, Henry, Boston.
Leeson, Joseph R., Newton Centre.
Lemme, Frederick, Arlington.
Leuchars, Robert B., Boston.
Lewis, A. S., Framingham.
Lewis, William G., Framingham.
Lincoln, George, Hingham.

Lincoln, Col. Solomon, Boston.
Little, James L., Jr., Brookline.
Locke, William H., Belmont.
Lockwood, Rhodes, Boston.
Lodge, G. Henry, M. D., Boston.
Loftus, John P., North Easton.
Loomis, Jason B., Boston.
Lord, George C., Newton.
Loring, Caleb W., Beverly Farms.
Loring, George B., Salem.
Lovett, George L., West Newton.
† Lowder, John, Watertown.
Lowell, Augustus, Boston.
Luke, Elijah H., Cambridgeport.
Lumb, William, Boston.
Lunt, Charles H., Jamaica Plain.
Lyman, Theodore, Brookline.
Lyon, Henry, Charlestown.

† Mahoney, John, Boston.
Mann, James F., Ipswich.
Mann, Jonathan, Milton.
Manning, Jacob W., Reading.
Manning, Mrs. Lydia B., Reading.
Manning, Robert, Salem.
Manning, Warren H., Reading.
Martin, Darius A., Chelsea.
Martin John S., Roxbury.
Matthews, Nathan, Boston.
McCarty, Timothy, Providence, R.I.
McClure, John, Revere.
McWilliam, George, Whitinsville.
Melvin, James C., West Newton.
Merriam, Herbert, Weston.
Merriam, M. H., Lexington.
Merrifield, William T., Worcester.
Metivier, James, Cambridge.
Minton, James, Boston.
Moore, John H., Concord.
Morrill, Joseph, Jr., Roxbury.
† Morse, Samuel F., Boston.
Morse, William A., Boston.
Motley, Thomas, Forest Hills.
Mudge, George A., Portsmouth, N.H.
Munroe, Otis, Boston.

Needham, Daniel, Groton.
Nevins, David, Framingham.
Newman, J. R., Winchester.
Newton, Rev. William W., Pittsfield.
Nickerson, Albert W., Marion.
Nickerson, George A., Dedham.
Norton, Charles W., Allston.
Nourse, Benjamin F., Boston.

Oakman, Hiram A., North Marshfield.
Osgood, James Ripley, Boston.

Packer, Charles H., Boston.
† Page, Thomas, Boston.
Paige, Clifton H., Boston.
Palmer, Julius A., Jr., Boston.
Parker, Augustus, Roxbury.
Parker, Mrs. Margaret, Wakefield.
Parkman, Francis, Jamaica Plain.
† Partridge, Henry, Dunkirk, N. Y.
Partridge, Horace, North Cambridge.
Paul, Alfred W., Dighton.
Peabody, John E., Salem.
Pearce, John, West Roxbury.
Peck, O. H., Denver, Col.
Peck, W. G., Arlington.
Peirce, Silas, Boston.
Penniman, A. P., Waltham.
Perkins, Augustus T., Boston.
Perkins, Edward N., Jamaica Plain.
Perkins, William P., Wayland.
† Perry, George W., Malden.
Philbrick, William D., Newton Centre.
Pierce, Dean, Brookline.
Pierce, Henry L., Boston.
Pierce, Samuel B., Dorchester.
Poor, John R., Somerville.
Potter, Joseph S., Arlington.
Prang, Louis, Roxbury.
Pratt, Laban, Dorchester.
Pratt, Lucius G., West Newton.
Pratt, Robert M., Boston.
Pratt, William, Winchester.
Pray, Mark W., Boston.
† Prescott, Eben C., Boston.
Prescott, William G., Boston.
Prescott, William G., Quincy.
Pringle, Cyrus G., Charlotte, Vt.
Proctor, Thomas P., West Roxbury.

Prouty, Gardner, Littleton.
Pulsifer, Royal M., Auburndale.
Putnam, Joshua H., Brookline.

Quinby, Hosea M., M.D. Worcester.

Rand, Miss Elizabeth L., Newton Highlands.
Rand, Oliver J., Cambridgeport.
Rawson, Warren W., Arlington.
Ray, James F., Franklin.
Ray, James P., Franklin.
Ray, Joseph G., Franklin.
Reed, George W., Boston.
Richards, John J., Boston.
Richardson, Charles E., Cambridgeport.
Rinn, J. Ph., Boston.
Ripley, Charles, Dorchester.
Robbins, I. Gilbert, Dorchester.
Robbins, Nathan, Arlington.
Robeson, William R., Boston.
Robinson, John, Salem.
Robinson Joseph B., Allston.
Ross, Henry, Newtonville.
Ross, M. Denman, Forest Hills.
Ross, Waldo O., Boston.
Ruddick, William H., M. D., South Boston.
Russell, George, Woburn.
Russell, John E., Leicester,
Russell, Walter, Arlington.

† Sanborn, Amos C., Cambridgeport.
Sanford, Oliver S., Hyde Park.
Sargent, Charles S., Brookline.
Sargent, John O., Lenox Furnace.
Saville, Richard L., Brookline.
Sawtelle, Eli A., Boston.
Sawyer, Timothy T., Charlestown.
† Scott, Charles, Newton.
Scudder, Charles W., Brookline.
Sears, J. Montgomery, Boston.
Seaver, Nathaniel, East Boston.
Shaw, Christopher C., Milford, N.H.
Shimmin, Charles F., Boston.
Shorey, John L., Lynn.
Skinner, Francis, Boston.
Smith, Benjamin G., Cambridge.
Smith, Calvin W., Grantville.
Smith, Charles H., Jamaica Plain.
Smith, Chauncey, Cambridge.
Smith, Edward N., San Francisco.
Smith, George O., Boston.
Smith, James H., Needham.
Snow, Eben, Cambridge.
Snow, Miss Salome H., Brunswick, Me.
Sparhawk, Edward C., Brighton.
Spaulding, Edward, West Newton.
Spaulding Mahlon D., Boston.
Speare, Alden, Newton Centre.
Spencer, Alfred W., Boston.
Springall, George, Malden.
Stetson, Nahum, Bridgewater.
Stewart, William J., Winchester.
Stickney, Rufus B., Somerville.
† Stimpson, George, New York, N.Y.
Stimpson, H. H., Cambridge.
Stone, Amos, Everett.
Stone, George F., Newton.
Stone, Phineas J., Charlestown.
Story, E. Augustus, Brighton.
Strong, William C., Newton Highlands.
Sturgis, John H., Brookline.
Sturgis, Russell, Manchester.
Sturtevant, E. Lewis, M.D., South Framingham.
Surette, Louis A., Concord.

Taft, John B., Cambridge.
Tarbell, George G., M.D., Boston.
Taylor, Horace B., Boston.
Thurlow, Thomas C., Newburyport.
Tidd, Marshall M., Woburn.
Tilton, Stephen W., Roxbury.
Todd, John, Hingham.
Tolman, Benjamin, Concord.
Tolman, Miss Harriet S., Boston.
Torrey, Everett, Charlestown.
† Turner, John M., Dorchester.
Turner, Roswell W., Dorchester.
Turner, Royal W., Randolph.

Underwood, Guy C., Roxbury.
Underwood, William J., Belmont.

Vinal, Miss Mary L., Somerville.
Vose, Benjamin C., Hyde Park.

Wainwright, William L., Braintree.
Wakefield, E. H., Cambridge.
Walcott, Henry P., M.D., Cambridge.
Wales, George O., Braintree.
Walker, Edward C. R., Roxbury.
Walker, Theophilus W., Waltham.
Walley, Mrs. W. P., Boston.
Walton, Daniel G., Wakefield.
Ward, John, Newton.
Wardwell, William H., Newton Centre.
Ware, Benjamin P., Beach Bluff.
Warren, George W., Boston.
Washburn, Andrew, Hyde Park.
Waters, Edwin F., Newton Centre.
Waters, George F., Boston.
Watson, Thomas A., East Braintree.
Watts, Isaac, Waverly.
Webber, Aaron D., Boston.
Weld, Aaron D., West Roxbury.
Weld, Christopher Minot, Jamaica Plain.
Weld, George W., Newport, R. I.
Weld, Moses W., M. D., Boston.
Weld, Richard H., Boston.
Weld, William G., Boston.
West, Mrs. Maria L., Neponset.
Weston, Leonard W., Lincoln.
Weston, Seth, Revere.
Wheeler, Frank, Concord.
Wheelwright, A. C., Boston.
Whipple, John A., Boston.
Whitcomb, William B., Medford.
White, Benjamin C., Boston.
White, Edward A., Boston.
White, Francis A., Brookline.
Whitely, Edward, Cambridgeport.
Whittle, George W., Westminster, Vt.
†Whytal, Thomas G., New York, N. Y.
Wilbur, George B., West Newton.
Wilder, Edward Baker, Dorchester
Wilder, Henry A., Malden.
Willard, E. W., Newport, R. I.
Willcutt, Levi L., West Roxbury.
Williams, Aaron D., Boston.
Williams, Benjamin B., Boston.
Williams, Philander, Taunton.
Willis, George W., Chelsea.
Willis, Joshua C., Roxbury.
Wilson, Henry W., Boston.
Wilson, William Power, Boston.
Woerd, Charles V., Waltham.
Woerd, Charles V., Jr., Waltham.
Wood, Charles G., Boston.
Wood, Luke H., Marlborough.
Wood, R. W., Jamaica Plain.
Wood, William K., West Newton.
Woods, Henry, Boston.
Woodward, Royal, Brookline.
Wright, George C., West Acton.

ANNUAL MEMBERS.

Members of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Abbot, Samuel L., M. D., Boston.
Abbott, Allen V., Boston.
Aird, Duncan, Belmont.
Allen, Charles L., Garden City, N.Y.
Andrews, Augustus, Dorchester.
Atkinson, Charles M., Brookline.
Atkinson, Edward, Brookline.
Atkinson, William B., Newburyport.

Bacon, Augustus, Roxbury.
Bacon, William, Roxbury.
Badlam, William H., Dorchester.
Barber, J. Wesley, Newton.
Bard, James, Framingham.
Barker, John G., Jamaica Plain.
Beard, Edward L., Cambridge.
Beebe, J. Arthur, Boston.
Beer, Carl, New York, N.Y.
Bird, John L., Dorchester.
Bliss, Benjamin K., Boston.
Bock, William A., North Cambridge.
Bolles, Matthew, Boston.
Bolles, William P., Roxbury.
Bolton, John B., Somerville.
Bowditch, E. F., Framingham.
Bowditch, James H., Brookline.
Bowker, Albert, East Boston.
Boyden, Clarence F., Taunton.
Breck, Charles H., Brighton.
Breck, Charles H. B., Brighton.
Brooks, George, Brookline.
Brown, Atherton T., Roxbury.
Brown, David H., West Medford.
Brown, Joseph T., Boston.
Burley, Edward, Beverly.
Butler, Edward, Wellesley.

Carter, Miss Maria E., Woburn.
Cartwright, James, Wellesley.
Chaffin, John C., Newton.
Chase, Joseph S., Malden.
Chase, Leverett M., Roxbury.
Cheney, Amos P., Natick.
Clark, James W., Framingham.
Clark, Joseph, Manchester.
Clark, Joseph W., Dedham.
Clark, Theodore M., Newtonville.
Collins, Frank S., Malden.
Comley, James, Lexington.
Crafts, William A., Boston.
Crosby, J. Allen, Jamaica Plain.
Curtis, Daniel T., Sharon.
Curtis, Joseph H., Boston.

Davenport, Albert M., Watertown.
Davis, Frederick, Newton.
Davis, Thomas M., Cambridgeport.
De Mar, John A., Brighton.
Ditson, Oliver, Boston.
Dolbear, Mrs. Alice J., College Hill.
Doliber, Thomas, Roxbury.
Doran, Enoch E., Brookline.
Doyle, William E., East Cambridge.
Duffley, Daniel, Brookline.

Eaton, Jacob, Cambridgeport.

Faxon, Edwin, Jamaica Plain.
Faxon, Marshall B., Boston.
Felton, Arthur W., West Newton.
Fenno, Warren, Revere.
Fergusson, Thomas M., Philadelphia, Pa.

Fisher, Frederick C., South Sudbury.
Fisher, Sewall, Framingham.
Forbes, William H., Jamaica Plain.
Foster, Joshua T., Medford.
Francis, George E., M.D., Worcester.
Frohock, Roscoe R., Malden.
Frost, Edward, Littleton.
Frost, George, West Newton.
Frost, Stiles, Newtonville.
Frost, Varnum, Belmont.
Frost, Warren S., Belmont.
Fuller, T. Otis, Needham.

Gibbon, Mrs. James A., Brookline.
Gilbert, Samuel, Boston.
Gill, Mrs. E. M., Medford.
Gill, George B., Medford.
Gleason, Herbert, Malden.
Godbold, Gustavus A., Chelsea.
Goddard, Thomas, Boston.
Gould, William P., Newtonville.
Grant, Charles E., Concord.
Gray, Howard, Dorchester.
Gray, William, Jr., Dorchester.
Grover, William O., Boston.
Guerineau, Louis, Cambridge.

Hall, Stacy, Boston.
Hall, William T., Revere.
Hamlin, Delwin A., Allston.
Hammond, Clement M., Hyde Park.
Harris, Miss Ellen M., Jamaica Plain.
Harris, Frederick L., South Natick.
Hartwell, Samuel, Lincoln.
Harwood, George S., Newton.
Hersey, Alfred H., Hingham.
Hersey, Edmund, Hingham.
Heustis, Warren, Belmont.
Hewins, James, Medfield.
Hews, Albert H., North Cambridge.
Hill, Benjamin D., Peabody.
Hill, Edwin S., Hyde Park.
Hill, J. Willard, Belmont.
Hill, Miss Katie A., Waverly.
Hunt, Henry C., Newton.

Jameson, G. W., East Lexington.
Judkins, Rev. B., West Dedham.

Kendall, Jonas, Framingham.
Kenrick, Miss Anna C., Newton.
Kidder, Francis H., Medford.

Lamprell, Simon, Marblehead.
Lang, John H. B., Boston.
Langmaid, Mrs. Mary, Somerville.
Lee, Francis H., Salem.
Loring, Charles G., Boston.
Loring, John A., Boston.
Lothrop, David W., West Medford.
Lothrop, Thornton K., Boston.
Low, Aaron, Essex.
Lowell, John, Newton.

Manda, W. A., Cambridge.
Manning, J. Woodward, Reading.
Marcou, Mrs. J., Cambridge.
Markoe, George F. H., Roxbury.
Martin, William J., Milton.
Maxwell, Charles E., Boston.
May, F. W. G., Boston.
McDermott, Andrew, Roxbury.
McIntosh, Aaron S., Roxbury.
McLaren, Anthony, Forest Hills.
McMillan, Robert, Whitinsville.
Meriam, Horatio C., D.M.D., Salem.
Merrill, J. Warren, Cambridgeport.
Merrill, S. A., Wollaston.
Meston, Alexander, Andover.
Mills, William, Somerville.
Morandi, Francis W., Malden.
Muzzey, Rev. Artemas B., Cambridge.

Nelson, Mrs. Thomas L., Worcester.
Nightingale, Rev. Crawford, Dorchester.
Norton, Michael H., Boston.
Norton, Patrick, Boston.

O'Brien, James, Jamaica Plain.

Park, William D., Boston.
Parker, George A., Halifax.
Parker, John, Boston.
Payson, Samuel R., Boston.
Peirce, George H., Concord.
Petremant, Robert, Roxbury.
Phillips, Nathaniel, Dorchester.

Pierce, Samuel H., Lincoln.
Pitcher, James R., Short Hills, N. J.
Plimpton, Willard P., West Newton.
Power, Charles J., South Framingham.
Prince, Thomas, Roxbury.
Purdie, George A., Wellesley Hills.
Putnam, Charles A., Salem.

Randall, Macey, Sharon.
Rich, William P., Chelsea.
Richards, John S., Brookline.
Richards, Mrs. P. D., West Medford.
Richardson, E. P., Lawrence.
Richardson, Horace, M.D., Boston.
Richardson, Spencer W., Boston.
Ridler, Charles E., Boston.
Robbins, Oliver R., Weston.
Robinson, William, North Easton.
Rogers, Samuel C. B., Jamaica Plain.
Ross, Charles W., Newtonville.

Safford, Nathaniel F., Milton.
Sanders, Dr. Orren S., Boston.
Saunders, Miss Mary T., Salem.
Sawtell, J. M., Fitchburg.
Schmitt, Georg A., Wellesley.
Scott, Augustus E., Lexington.
Scott, John W., Nahant.
Scudder, Samuel H., Cambridge.
Sharples, Stephen P., Cambridge.
Shattuck, Frederick R., Roxbury.
Shedd, Abraham B., Weston.
Sheppard, Edwin, Lowell.
Sheppard, Samuel A. D., Newton.
Snow, Eugene A., Melrose.
Snow, Francis B., Dorchester.
Southworth, Edward, Quincy.
Spooner, William H., Jamaica Plain.
Squire, John P., Arlington.
Stearns, Charles H., Brookline.
Stevenson, Hamilton, Woburn.
Stone, Samuel G., Charlestown.
Storer, Charles, Natick.
Story, Miss Sarah W., Brighton.
Strahan, Thomas, Chelsea.
Swan, Charles W., M. D., Boston.

Tailby, Joseph, Wellesley.
Talbot, Josiah W., Norwood.
Teel, William H., West Acton.
Temple, Felker L., Somerville.
Terwilliger, S. F., Saratoga Springs, N. Y.
Tillinghast, Joseph, New Bedford.
Tobey, S. Edwin, Boston.
Torrey, Bradford, Boston.
Tousey, Prof. William G., College Hill.
Turner, Nathaniel W., Boston.

Van der Veur, P.W., New York, N.Y.
Vaughan, J. C., Chicago, Ill.

Walker, Joseph T., Watertown, N.Y.
Walker, William P., Somerville.
Waterer, Hosea, South Natick.
Wellington, Miss Caroline, East Lexington.
Wells, Benjamin T., Newton.
Weston, Mrs. L. P., Danvers.
Wheatland, Henry, M.D., Salem.
Whitney, Joel, Winchester.
Whiton, Starkes, Hingham Centre.
Wilmarth, Henry D., Jamaica Plain.
Wilson, B. Osgood, Watertown.
Wilson, George W., Malden.
Wolcott, Mrs. Henrietta L. T., Dedham.
Wood, Mrs. Anna D., West Newton.
Wood, E. W., West Newton.
Woodford, Joseph H., Newton.
Woolson, George C., Passaic, N. J.
Worthington, Roland, Roxbury.
Wright, Daniel, Lowell.

Zirngiebel, Denys, Needham.

EXTRACTS FROM THE CONSTITUTION AND BY-LAWS.

SECTION XXVI. — Life Members.

The payment of thirty dollars shall constitute a Life Membership, and exempt the member from all future assessments; and any member having once paid an admission fee may become a Life Member by the payment of twenty dollars in addition thereto.

SECTION XXVII. — Admission Fee and Annual Assessment.

Every subscription member, before he receives his diploma, or exercises the privileges of a member, shall pay the sum of ten dollars as an admission fee, and shall be subject afterwards to an annual assessment of two dollars.

SECTION XXIX. — Discontinuance of Membership.

Any member who shall neglect for the space of two years to pay his annual assessment shall cease to be a member of the Society, and the Treasurer shall erase his name from the List of Members. Any member may withdraw from the Society, on giving notice to the Treasurer and paying the amount due from him to the Society.

The attention of Annual Members is particularly called to Section XXIX.

HONORARY MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly communicating to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Joseph Maxwell, *elected in* 1830, *and* George W. Smith, *elected in* 1851. *The names of those known to be deceased are marked with a star.*

*Benjamin Abbott, LL. D., Exeter, N. H.

*John Abbott, Brunswick, Me.

*Hon. John Quincy Adams, LL. D., late President of the United States, Quincy.

*Professor Louis Agassiz, Cambridge.

*William T. Aiton, late Curator of the Royal Gardens, Kew, England.

*Thomas Allen, late President of the St. Louis Horticultural Society, St. Louis, Mo., and Pittsfield, Mass.

*Hon. Samuel Appleton, Boston.

*Hon. James Arnold, New Bedford.

*Edward Nathaniel Bancroft, M. D., late President of the Horticultural and Agricultural Society of Jamaica.

*Hon. Philip P. Barbour, Virginia.

*Don Angel Calderon de la Barca, late Spanish Minister at Washington.

*Robert Barclay, Bury Hill, Dorking, Surrey, England.

*James Beekman, New York.

*L'Abbé Berlèse, Paris.

*Nicholas Biddle, Philadelphia.

*Dr. Jacob Bigelow, Boston.

*Mrs. Lucy Bigelow, Medford.

*Le Chevalier Soulange Bodin, late Secrétaire Général de la Société d'Horticulture de Paris.

Hon. George S. Boutwell, Groton.

*Josiah Bradlee, Boston.

*Hon. George N. Briggs, Pittsfield.

*Hon. James Buchanan, late President of the United States, Lancaster, Penn.

*Hon. Jesse Buel, late President of the Albany Horticultural Society, Albany, N. Y.

*Hon. Edmund Burke, late Commissioner of Patents, Washington, D. C.

*Augustin Pyramus de Candolle, Geneva, Switzerland.
*Hon. Horace Capron, late U. S. Commissioner of Agriculture, Washington, D. C.
*Commodore Isaac Chauncey, U. S. Navy, Brooklyn, N. Y.
*Ward Chipman, late Chief-Justice of New Brunswick, St. John.
*Lewis Clapier, Philadelphia.
*Hon. Henry Clay, Lexington, Ky.
H. W. S. Cleveland, Minneapolis, Minn.
*Admiral Sir Isaac Coffin, Bart., England.
*Zaccheus Collins, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Roswell L. Colt, Paterson, N. J.
Caleb Cope, Ex-President of the Pennsylvania Horticultural Society, Philadelphia.
*William Coxe, Burlington, N. J.
*John P. Cushing, Watertown.
*Charles W. Dabney, late U. S. Consul, Fayal, Azores.
*Hon. John Davis, LL. D., Boston.
*Sir Humphry Davy, London.
*Gen. Henry Alexander Scammel Dearborn, Roxbury.
*James Dickson, late Vice-President of the Horticultural Society of London.
*Mrs. Dorothy Dix, Boston.
*Capt. Jesse D. Elliot, U. S. Navy.
*Hon. Stephen Elliot, LL. D., Charleston, S. C.
*Hon. Henry L. Ellsworth, late Commissioner of Patents, Washington, D. C.
*Allyn Charles Evanson, late Secretary of the King's County Agricultural Society, St. John, N. B.
*Hon. Edward Everett, LL. D., Boston.
*Hon. Horace Everett, Vermont.
*F. Faldermann, late Curator of the Imperial Botanic Garden, St. Petersburg.
*Hon. Millard Fillmore, late President of the United States, Buffalo, N.Y.
*Dr. F. E. Fischer, late Professor of Botany at the Imperial Botanic Garden, St. Petersburg.
*Hon. Theodore Frelinghuysen, late President of the American Agricultural Society, New Brunswick, New Jersey.
*Joseph Gales, Jr., late Vice-President of the Horticultural Society, Washington, D. C.
*George Gibbs, New York.
*Stephen Girard, Philadelphia.
*Hon. Robert T. Goldsborough, Talbot County, Maryland.
*Ephraim Goodale, South Orrington, Maine.
*Mrs. Rebecca Gore, Waltham.
*Hon. John Greig, late President of the Domestic Horticultural Society, Canandaigua, N. Y.

*Mrs. Mary Griffith, Charlieshope, N. J.
*Gen. William Henry Harrison, late President of the United States, North Bend, Ohio.
*S. P. Hildreth, M. D., Marietta, Ohio.
*Thomas Hopkirk, late President of the Glasgow Horticultural Society.
*David Hosack, M. D., late President of the New York Horticultural Society.
*Lewis Hunt, Huntsburg, Ohio.
*Joseph R. Ingersoll, late President of the Pennsylvania Horticultural Society, Philadelphia.
*Gen. Andrew Jackson, late President of the United States, Nashville, Tenn.
*Mrs. Martha Johonnot, Salem.
*Jared Potter Kirtland, M. D., LL.D., East Rockport, Ohio.
*Thomas Andrew Knight, late President of the Horticultural Society of London.
*Gen. La Fayette, La Grange, France.
*Le Comte de Lasteyrie, late Vice-President of the Horticultural Society of Paris.
L. A. H. Latour, M. P., Montreal, Canada.
*Baron Justus Liebig, Giessen, Germany.
*Professor John Lindley, late Secretary of the Horticultural Society of London.
*Franklin Litchfield, late U. S. Consul at Puerto Cabello, Venezuela.
*Joshua Longstreth, Philadelphia.
*Nicholas Longworth, Cincinnati, Ohio.
*Jacob Lorillard, late President of the New York Horticultural Society.
*John Claudius Loudon, London.
*Hon. John A. Lowell, Boston.
*Baron Charles Ferdinand Henry Von Ludwig, late Vice-President of the South African Literary and Scientific Institution, Cape Town, Cape of Good Hope.
*Hon. Theodore Lyman, Brookline.
Col. Theodore Lyman, Brookline.
*Hon. James Madison, late President of the United States, Montpelier, Va.
*Mrs. Charlotte Maryatt, Wimbledon, near London.
Joseph Maxwell, Rio Janeiro.
*D. Smith McCauley, late U. S. Consul-General at Tripoli, Philadelphia.
*Hon. Isaac McKim, late President of the Horticultural Society of Maryland, Baltimore.
Rev. James H. Means, Dorchester, Mass.
*James Mease, M. D., Philadelphia.
*Lewis John Mertens, Brussels, Belgium.
*Hon. Charles F. Mercer, Virginia.
*François André Michaux, Paris.
Donald G. Mitchell, New Haven, Conn.
*Samuel L. Mitchill, M. D., LL.D., New York.

*Hon. James Monroe, late President of the United States, Oak Hill, Va.
*Alfred S. Monson, M. D., late President of the New Haven Horticultural Society, New Haven, Conn.
*Hon. A. N. Morin, Montreal, Canada.
*Théodore Mosselmann, Antwerp, Belgium.
Baron R. Von Osten Sacken, Heidelberg, Germany.
*Baron Ottenfels, late Austrian Minister to the Ottoman Porte.
*John Palmer, Calcutta.
*Hon. Joel Parker, LL. D., Cambridge.
Samuel B. Parsons, Flushing, N. Y.
*Hon. Thomas H. Perkins, Brookline.
*Antoine Poiteau, late Professor in the Institut Horticole de Fromont.
*Hon. James K. Polk, late President of the United States, Nashville, Tenn.
*John Hare Powel, Powelton, Pa.
*Henry Pratt, Philadelphia.
*William Prince, Flushing, N. Y.
*Rev. George Putnam, D. D., Roxbury.
*Col. Joel Rathbone, late President of the Albany and Rensselaer Horticultural Society, Albany, N. Y.
*Archibald John, Earl of Roseberry, late President of the Caledonian Horticultural Society.
*Joseph Sabine, late Secretary of the Horticultural Society of London.
*Don Ramon de la Sagra, Havana, Cuba.
*Henry Winthrop Sargent, Fishkill, N. Y.
*Sir Walter Scott, Abbotsford, Scotland.
*John Shepherd, late Curator of the Botanic Garden, Liverpool, England.
*John S. Skinner, late Editor of the American Farmer, Baltimore, Md.
George W. Smith, Boston.
*Stephen H. Smith, late President of the Rhode Island Horticultural Society.
*Hon. Charles Sumner, Boston.
*Hon. John Taliaferro, Virginia.
*Gen. James Talmadge, late President of the American Institute, New York.
*Gen. Zachary Taylor, late President of the United States, Baton Rouge, La.
*James Thacher, M. D., Plymouth.
John J. Thomas, Union Springs, N. Y.
*James W. Thompson, M. D., Wilmington, Del.
*Grant Thorburn, New York.
*M. Du Petit Thouars, Paris.
*Le Vicomte Héricart De Thury, late President of the Horticultural Society of Paris.
*Mons. Tougard, late President of the Horticultural Society of Rouen, France.
*Gen. Nathan Towson, late President of the Horticultural Society, Washington, D. C.

*Hon. John Tyler, late President of the United States, Williamsburg, Va.
*Rev. Joseph Tyso, Wallingford, England.
*Hon. Martin Van Buren, late President of the United States, Kinderhook, N. Y.
*Federal Vanderburg, M. D., New York.
*Jean Baptiste Van Mons, M. D., Brussels, Belgium.
*Gen. Stephen Van Rensselaer, Albany, N. Y.
*Joseph R. Van Zandt, Albany, N. Y.
*Benjamin Vaughan, M. D., Hallowell, Me.
*Petty Vaughan, London.
*Rev. N. Villeneuve, Montreal, Canada.
*Pierre Philippe André Vilmorin, Paris.
*James Wadsworth, Geneseo, N. Y.
*Nathaniel Wallich, M. D., late Curator of the Botanic Garden, Calcutta.
*Malthus A. Ward, M. D., late Professor in Franklin College, Athens, Ga.
*Hon. Daniel Webster, Marshfield.
*Hon. John Welles, Boston.
*Jeremiah Wilkinson, Cumberland, R. I.
Hon. Robert C. Winthrop, Boston.
*Frederick Wolcott, Litchfield, Conn.
*Ashton Yates, Liverpool, England.
*Lawrence Young, late President of the Kentucky Horticultural Society, Louisville.

CORRESPONDING MEMBERS.

Members and correspondents of the Society and all other persons who may know of deaths, changes of residence, or other circumstances showing that the following list is inaccurate in any particular, will confer a favor by promptly reporting to the Secretary the needed corrections.

Information, or any clew to it, is especially desired in regard to Alexander Burton, *elected in* 1829, S. Reynolds, M. D., 1832, *and* Francis Summerest, 1833. *The names of those known to be deceased are marked with a star.*

*John Adlum, Georgetown, D. C.

*Don Francisco Aguilar y Leal, late U. S. Vice-Consul at Maldonado, Banda Oriental del Uruguay.

*Mons. Alfroy, Lieusaint, France.

*James T. Allan, late President of the Nebraska State Horticultural Society, Omaha.

A. B. Allen, New York.

*Rev. Thomas D. Anderson, D. D., South Boston.

Édouard André, Redacteur en chef de la Revue Horticole, Paris, France.

*Thomas Appleton, late U. S. Consul at Leghorn, Italy.

*Col. Thomas Aspinwall, late U. S. Consul at London, Brookline.

P. M. Augur, State Pomologist, Middlefield, Conn.

*Isaac Cox Barnet, late U. S. Consul at Paris.

Patrick Barry, Ex-First Vice-President of the American Pomological Society, Rochester, N. Y.

*Augustine Baumann, Bolwiller, Alsace.

*Eugène Achille Baumann, Rahway, N. J.

*Joseph Bernard Baumann, Bolwiller, Alsace.

Napoleon Baumann, Bolwiller, Alsace.

D. W. Beadle, St. Catherine's, Ontario.

Professor William J. Beal, Lansing, Michigan.

*Noel J. Becar, Brooklyn, N. Y.

*Edward Beck, Worton College, Isleworth, near London.

Rev. Henry Ward Beecher, Peekskill, N. Y.

*Louis Édouard Berckmans, Rome, Ga.

Prosper J. Berckmans, Augusta, Ga.

*Alexander Bivort, late Secretary of the Société Van Mons, Fleurus, Belgium.

*Tripet Le Blanc, Paris.

Dr. Ch. Bolle, Berlin, Prussia.

*Charles D. Bragdon, Pulaski, Oswego Co., N. Y.

*William D. Brinckle, M. D., Philadelphia.

*George Brown, late U. S. Commissioner to the Sandwich Islands, Beverly.
*John W. Brown, Fort Gaines, Ga.
*Dr. Nehemiah Brush, East Florida.
*Arthur Bryant, Sr., late President of the Illinois State Horticultural Society, Princeton.
Professor J. L. Budd, Secretary of the Iowa Horticultural Society, Ames.
*Robert Buist, Philadelphia.
*Dr. E. W. Bull, Hartford, Conn.
William Bull, Chelsea, England.
Rev. Robert Burnet, Ex-President of the Ontario Fruit Growers' Association, Burlington.
Alexander Burton, United States Consul at Cadiz, Spain, Philadelphia.
Isidor Bush, Bushberg, Jefferson Co., Mo.
George W. Campbell, Delaware, Ohio.
*Francis G. Carnes, New York.
*Col. Robert Carr, Philadelphia.
*Rev. John O. Choules, D. D., Newport, R. I.
*Rev. Henry Colman, Boston.
*James Colvill, Chelsea, England.
Maxime Cornu, Directeur du Jardin des Plantes, Paris, France.
Benjamin E. Cotting, M. D., Boston.
*Samuel L. Dana, M. D., Lowell.
*J. Decaisne, late Professeur de Culture au Muséum d'Histoire Naturelle, Jardin des Plantes, Paris.
*James Deering, Portland, Me.
*H. F. Dickehut.
*Sir C. Wentworth Dilke, Bart., London.
*Hon. Allen W. Dodge, Hamilton.
Rev. H. Honywood D'Ombrain, Westwell Vicarage, Ashford, Kent, England.
Robert Douglas, Waukegan, Illinois.
*Andrew Jackson Downing, Newburg, N. Y.
*Charles Downing, Newburg, N. Y.
W. T. Thiselton Dyer, C.M.G., F.R.S., Director of the Royal Botanic Gardens, Kew, England.
Parker Earle, Cobden, Ill.
*F. R. Elliott, late Secretary of the American Pomological Society, Cleveland, Ohio.
George Ellwanger, Rochester, N. Y.
Henry John Elwes, F.L.S., F.Z.S., Preston Hall, Cirencester, England.
*George B. Emerson, LL. D., Winthrop.
*Ebenezer Emmons, M. D., Williamstown.
*Andrew H. Ernst, Cincinnati, O.
*Nathaniel Fellows, Cuba.
*Henry J. Finn, Newport, R. I.
*Willard C. Flagg, late Secretary of the American Pomological Society, Moro, Ill.

*Michael Floy, late Vice-President of the New York Horticultural Society, New York City.
*John Fox, Washington, D. C.
*Hon. Russell Freeman, Sandwich.
Andrew S. Fuller, Ridgewood, N. J.
Henry Weld Fuller, Roxbury.
Hon. Robert W. Furnas, President of the Nebraska State Horticultural Society, Brownville.
*Augustin Gande, late President of the Horticultural Society, Department of the Sarthe, France.
*Robert H. Gardiner, Gardiner, Me.
*Benjamin Gardner, late U. S. Consul at Palermo, Sicily.
*Capt. James T. Gerry, U. S. Navy.
Charles Gibb, Corresponding Secretary of the Fruit Growers' Association, Abbotsford, Quebec.
*Abraham P. Gibson, late U. S. Consul at St. Petersburg.
*R. Glendinning, Chiswick, near London.
Professor George L. Goodale, Cambridge.
*George W. Gordon, late U. S. Consul at Rio Janeiro, Boston.
Professor Asa Gray, Cambridge.
Obadiah B. Hadwen, ex-President of the Worcester County Horticultural Society, Worcester.
*Charles Henry Hall, New York.
*Abraham Halsey, late Corresponding Secretary of the New York Horticultural Society, New York.
*Dr. Charles C. Hamilton, late President of the Fruit Growers' Association and International Show Society of Nova Scotia, Cornwallis.
*Rev. Thaddeus Mason Harris, D. D., Dorchester.
*Thaddeus William Harris, M. D., Cambridge.
*John Hay, late Architect of the Caledonian Horticultural Society.
*Bernard Henry, late U. S. Consul at Gibraltar, Philadelphia.
Shirley Hibberd, Editor of the Gardeners' Magazine, London.
*J. J. Hitchcock, Baltimore.
Robert Hogg, LL. D., Editor of the Journal of Horticulture, London.
*Thomas Hogg, New York.
Thomas Hogg, New York.
J. C. Holding, Ex-Treasurer and Secretary of the Cape of Good Hope Agricultural Society, Cape Town, Africa.
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*DAVID LANDRETH, late Corresponding Secretary of the Pennsylvania Horticultural Society, Bristol, Pa.
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*E. S. H. LEONARD, M. D., Providence, R. I.
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*ALLAN MELVILL, New York.
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*ÉDOUARD MORREN, Editor of the Belgique Horticole, Liège, Belgium.
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DR. JOSEPH STAYMAN, Leavenworth, Kansas.

*Capt. Thomas Holdup Stevens, U. S. Navy, Middletown, Conn.
*William Fox Strangeway, late British Secretary of Legation at Naples, Italy.
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William Summer, Pomaria, S. C.
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*Luther Tucker, late Editor of the Cultivator, Albany, N. Y.
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*Alexander Vattemare, Paris.
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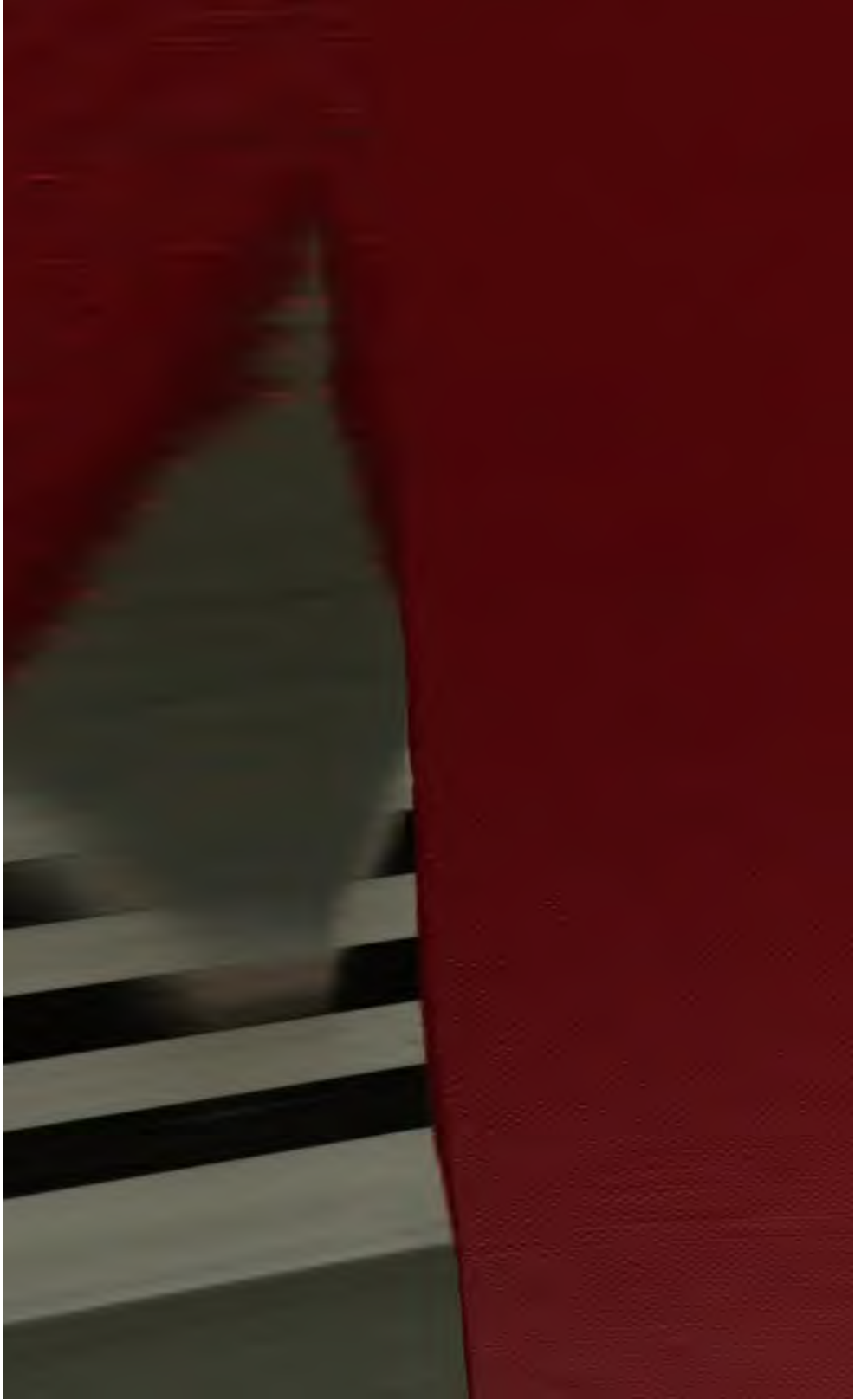
*Emilien de Wael, late Secretary of the Horticultural Society, Antwerp, Belgium.
*John A. Warder, M. D., late President of the Ohio State Horticultural Society, North Bend, Ohio.
Anthony Waterer, Knapp Hill, near Woking, Surrey, England.
*J. Ambrose Wight, late Editor of the Prairie Farmer, Chicago, Ill.
Benjamin Samuel Williams, Upper Holloway, London, N.
Professor John Wilson, Edinburgh University, Scotland.
*William Wilson, New York.
*Hon. J. F. Wingate, Bath, Me.
*Gen. Joshua Wingate, Portland, Me.
*Joseph Augustus Winthrop, Charleston, S. C.

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